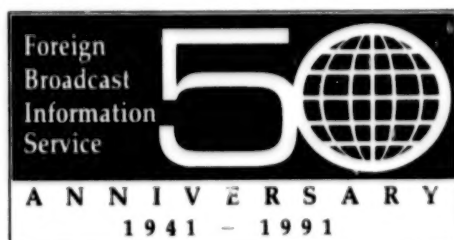


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19 MARCH 1991



JPRS Report

Nuclear Developments

NUCLEAR DEVELOPMENTS

JPRS-TND-91-004

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SOUTH AFRICA

Environmental Advantages of Nuclear Power

91AF0634Y Johannesburg FINANCIAL MAIL
in English 18 Jan 91 p 57

[Text] Nuclear power, all but written off after the Three Mile Island and Chernobyl disasters, is making a comeback. And, ironically, its resurgence is being fuelled by environmental fears.

Nuclear power plants are now increasingly seen as non-polluting alternatives to coal and oil-burning plants. Nuclear plants release no noxious gases while coal- and oil-burning plants despoil the environment and are a major factor—in the opinion of many experts—behind the greenhouse effect. For example, in the Highveld, where most of Eskom's [Electricity Supply Commission's] coal-fired plants are located, the air is considered among the most polluted in the Western world.

In June FORBES magazine called nuclear power "the greenest form of power" and cited the growing realisation in the United States that nuclear power could be more environmentally acceptable than coal.

"Nuclear power is making an important contribution to the environment," says the president of the American Nuclear Society, Walter Loewenstein, who spoke at last year's Eskom-organised symposium on Nuclear Technology in Southern Africa. "A recent study cites France (which generates more than 75 percent of its electricity from nuclear power) as having reduced emissions of SO₂, NO₂ and dust by 56 percent, 9 percent and 36 percent, respectively, from 1980 to 1986."

In this period, France's nuclear generation increased fourfold while total electricity generation rose by only 40 percent, he says.

Waste disposal has always been the Achilles heel of nuclear power, but many countries are solving the problem with state-of-the-art waste storage facilities. The Atomic Energy Corp has never had trouble with its facility for low- and medium-active nuclear waste at a remote, geologically stable site at Vaalputs in the north-western Cape. Highly active waste is sent to France for more processing.

If environmentalists drop their objections to nuclear power, plant construction could boom worldwide. And SA [Republic of South Africa], sitting on 14 percent of the world's uranium reserves, would be a big winner.

However, with uranium prices at rock bottom for much of the Eighties, SA is squandering much of this valuable resource. Uranium is found mainly in the same rock as gold and is produced as a byproduct of gold mining. But low prices mean it is not profitable to take more than a fraction of the mines' uranium "tailings" and turn it into the "yellow cake" uranium (ammonium diuranate) used to produce U235 fuel for nuclear power generation.

Unutilised tailings are either buried under tons of rubble or are simply used to fill disused mineshafts.

"These tailings will thus no longer be available for exploitation," says Atomic Energy Corp CE Waldo Stumpf. "As we expect the world nuclear industry to take off again from 1995 onwards, and as SA will need to build additional nuclear power stations, we cannot afford this waste."

With the virtual suspension of nuclear plant construction worldwide, sending the uranium price down from US\$43/lb in 1978 to below \$10/lb now, production at SA's gold mines has dropped to only 3,000 t/year, from 4,600 t/year in 1986. Gencor was also forced to close its Beisa uranium mine. But if the price revives, SA's potential is enormous: it has known uranium reserves of 432,500 t, as well as 130,000 t of thorium, which is used in converter reactors.

Stumpf reckons that the corporation could make uranium mining more profitable by developing new technologies to enrich uranium locally. "We hope to perfect these more economically viable technologies, such as centrifuge and laser enrichment processes, over the next 5 years so that the 'yellow cake' can be transformed into more valuable U235, mainly for export. Should we be successful, the added value will be about 300 percent." The company is also working on ways of making the cost of nuclear power more competitive with coal-based power.

While the brighter outlook for nuclear power promises to rescue SA's uranium industry, it may also boost SA's own nuclear power industry. The ANC [African National Congress] has promised a no-nukes policy—which will include shutting down SA's only nuclear plant at Koeberg and scrapping plans to build others. But nuclear power's greener image may cause the ANC to have a change of heart. In any event, it probably will have to. The country's massive coal reserves could begin running out by the middle of the next century. Eskom now estimates that its last coal-fired power station using local coal must be commissioned by 2045. And that's not as far off as it sounds, considering that it can take 10 years or more from preliminary planning to the final commissioning of a 3,500 MW power station.

Coal now provides 89.6 percent of SA's power. Nuclear generates 7.7 percent and hydroelectric the rest. In the United States, by comparison, about 20 percent is generated by nuclear power plants, according to Loewenstein, of the American Nuclear Society. Worldwide, there were 417 nuclear plants operating at the end of 1989 producing 17 percent of the world's electricity, he says.

With Eskom already well advanced on choosing sites for new nuclear power stations, SA should be drawing more nuclear energy from early next century. "We have identified two potential sites—one on the Cape south coast

(Bantamsklip, near Gansbaai) and one on the Cape east coast (Oyster Bay, near Port Elizabeth)—and we are also looking for sites on the Cape west coast," says Eskom CE Ian McRae.

Adds Eskom spokesman Johan van Heerden: "With the average life expectancy of any power station in the region of 40 years, SA could be totally dependent on nuclear power generation by 2085."

Country Joins Treaty Banning Seabed Weapons

OW0203103691 Beijing XINHUA Domestic Service
in Chinese 0820 GMT 2 Mar 91

[Text] Beijing, 2 Mar (XINHUA)—The Chinese Embassies in the United States, Britain, and the Soviet Union on 28 February submitted a statement to the governments of these three countries, declaring that China has joined the "Treaty Banning the Installation of Nuclear and Other Mass Destructive Weapons on the Seabed and Its Subsoil."

The treaty, signed in 1971, became effective in 1972. The core of the treaty is that all signatories undertake the obligation not to install "any nuclear or other kinds of mass destructive weapons, and structures, launching facilities, or any other equipment exclusively for storing, experimenting, and using such weapons" on the seabed and in its subsoil of the high seas. The United States, Britain, and the Soviet Union are the nations which possess copies of the treaty.

China has consistently advocated a comprehensive ban and total elimination of nuclear and other weapons of mass destruction. The goal, contents, and enforcement of the treaty show that it can exert a positive influence on averting the installation and deployment of nuclear weapons on the seabed and in its subsoil.

In the statement on joining the treaty, the Chinese Government declares: Any stipulation in the treaty should not be interpreted as an infringement upon the PRC's sovereignty and other rights in its territorial waters and the waters, seabed, and subsoil bordering its territorial waters; the Taiwan authorities' unlawful use of the name of China in signing and ratifying the treaty in 1971 and 1972 is null and void.

South Korean Experts To Run Reactor Safety Checks

SK2502090691 Seoul YONHAP in English 0726 GMT
25 Feb 91

[Text] Seoul, Feb. 25 (OANA-YONHAP)—South Korean nuclear experts will conduct pre-service inspections on the Daya Bay reactors I and II, now under construction in the southern Chinese province of Guangdong near Hong Kong, a spokesman for the Korea Atomic Energy Research Institute (KAERI) said Monday.

KAERI has signed a 300,000 U.S. dollar contract with the Research Institute of Nuclear Power Operation of China to check the safety of the pressurized water reactors before commercial operation begins in 1992, he said.

Over the next 18 months, KAERI officials will carry out non-destructive ultraphonic, liquid-penetrant and radiographic tests on pressure vessels, welded points and support structures in the reactors.

This is Korea's first export of nuclear reactor-related service and the first example of Seoul-Beijing technology cooperation in the field of nuclear safety.

Korea was totally dependent on foreign technology for the safety of its reactors until KAERI localized the technology in 1985.

Korea has saved 10 million dollars a year by performing its own pre-service and in-service inspections on the nine reactors across the country.

Application of Nuclear Technology Studied

HK2802085091 Hong Kong ZHONGGUO TONGXUN
SHE in Chinese 0628 GMT 25 Feb 91

[Dispatch: "Nuclear Technology Has Become China's New High-Tech Industry"—ZHONGGUO TONGXUN SHE headline]

[Text] Beijing, 25 Feb (ZHONGGUO TONGXUN SHE)—At present, China's nuclear technology is being widely applied to all sectors of the national economy, including industry, agriculture, medicine, resources, environmental protection, scientific research, and education. Next only to the nuclear energy industry, it has become the second largest new high-tech industry of China's nuclear industries.

At present, over 2,000 units throughout the country are engaged in the technological development of isotopes and radiation and their application to production. By using methods that integrate radiation with other technologies, China has developed and bred 325 new crop varieties and promoted them in an area of 140 million mu, with an annual increase in grain output ranging from 3.7 billion to 4 billion kg, cotton output from 150 million to 200 million kg, and oil-bearing crops from 20 million to 75 million kg.

In the medical area, nuclear technology has provided effective means for clinical diagnosis, treatment, and pathological and pharmacological research. In the prevention and curing of diseases, especially in the discovery of cancer at an early stage and in its diagnosis and treatment, nuclear technology plays an important part. At present, more than 1,000 medical units around the country use isotopic and radioactive technology, and they admit and treat over 10 million patients each year.

At present, industrial branches across the country possess over 7,000 nuclear apparatuses and instruments of all kinds. In the future, China will build more than 150 radioactive installations and 25 industrial radioactive accelerators, thus giving form to its radioactive processing industries.

Update on Status of Qinshan Nuclear Power Plant

HK2002062591 Hong Kong ZHONGGUO TONGXUN SHE in Chinese 1330 GMT 19 Feb 91

[Report: "Construction Quality at Qinshan Nuclear Power Plant Is Kept to Strictest Engineering Standards"—ZHONGGUO TONGXUN SHE headline]

[Text] Hangzhou, 19 Feb (ZHONGGUO TONGXUN SHE)—After five years of construction, Qinshan Nuclear Power Plant, China's first Chinese-designed and built nuclear power plant, is now at the final stage.

Qinshan Nuclear Power Plant was originally scheduled to be completed and generate electricity through a joint network at the end of 1990, but construction was postponed to this year. According to a responsible person from the nuclear power company, the postponement in construction of this project was not because of technologically unsafe factors, but mainly because the original planned time limit was too short, some installations arrived rather late, and it took some time to resolve problems in design and installation which were revealed in testing. The idea of "better slower and more expensive with the greatest care possible" has run through the whole construction process of Qinshan Nuclear Power Plant.

Along the seaside on the outskirts of the plant stands a 1,800-meter embankment to ward off surging tides. The original height of this embankment was designed on the

assumption that the highest tide level in 1,000 years and the biggest storm in a century would take place simultaneously. During a later appraisal and examination, experts from the State Nuclear Safety Administration pointed out the need to further reinforce the safety standard. Therefore, workers built another 50-cm high tide-guard wall on top of the embankment, which had been built according to the original design. There are quite a number of such examples in Qinshan Nuclear Power Plant whereby safety measures were calculated from various exceptional assumptions.

The whole process of design, manufacture, construction, and production preparation at the Qinshan Nuclear Power Plant has been carried out under strict control. The plant should not only observe relevant regulations and subject itself to supervision by international atomic power institutions, but should also abide by relevant stipulations issued by China and subject itself to the supervision of the State Nuclear Safety Administration. In line with relevant stipulations, the nuclear power plant has drawn up an outline of quality control which has been put into effect in various relevant units. There are nearly 900 specially assigned personnel at the construction site responsible for quality control. The nuclear power company and the unit in charge of construction have set up 244 appropriate management systems while a detailed record is made of every link, including design, construction, and production preparation, to achieve the goal of following regulations and verifying evidence.

JAPAN

Kanemaru on U.S.-DPRK Nuclear Talk Mediation

OW0403051491 Tokyo NHK General Television Network in Japanese 1000 GMT 3 Mar 91

[Text] Former Deputy Prime Minister Kanemaru of the ruling Liberal Democratic Party [LDP] has revealed that he is ready to act as intermediary for talks between the United States and North Korea, the DPRK, on the issue of nuclear inspections of North Korea by an international agency. He made the revelation in a lecture he gave in Minokamo City, Gifu Prefecture, today.

In the lecture, the former deputy prime minister said: The resolution of the issue of nuclear inspections of North Korea is indispensable for improving relations between Japan and North Korea, and this requires talks between the United States and North Korea. I have made this proposal to the North Korean side. I understand, on the other hand, that U.S. President Bush wants to meet me. As far as I am concerned, I think it is only natural to consider such Japan-U.S. talks for improving relations between Japan and North Korea.

This statement by former Deputy Prime Minister Kanemaru is meant to clarify his readiness to visit Washington for talks with President Bush, if circumstances require, in order to break the deadlock in the issue of nuclear inspections of North Korea by an international agency. He takes into account the talks he had with President Kim Il-song and other North Korean leaders during his visit to Pyongyang last year. Nuclear inspections of North Korea are called for by the United States. Thus, Mr. Kanemaru made clear his readiness to act as intermediary between the United States and North Korea for setting up a venue for talks between them.

South Korea Agrees to Nuclear Safety Proposal

OW0803130591 Tokyo KYODO in English 1243 GMT 8 Mar 91

[Text] Tokyo, March 8 KYODO—South Korea has agreed to Japan's proposal on building up wide-ranging bilateral cooperation to boost the safety of nuclear power plants, the Agency of Natural Resources and Energy announced Friday.

The two countries have agreed to hold annual meetings to exchange information on issues of nuclear safety, to exchange published information on the actual operations of nuclear power plants every three months, and to exchange nuclear experts. The five-year agreement, to start this year, can be extended through mutual agreement.

The new pact is the embodiment of an accord between the two governments aimed at building cooperation in the area of nuclear power policy, which was reached when South Korean President No Tae-u visited Japan last May.

South Korea is the fifth country with which Tokyo has such a bilateral agreement on nuclear power safety. The others are the United States, Germany, France, and Sweden.

Automatic Shutdown at Nuclear Fuel Plant

OW0903073091 Tokyo KYODO in English 0719 GMT 9 Mar 91

[Text] Mito, March 9 KYODO—Rising temperature automatically shut down a container dissolving enriched uranium at Japan's sole nuclear fuel reprocessing plant at Tokai Friday but no radioactive material was leaked into the air, officials at the facility reported Saturday.

The incident at the Nuclear Reactor and Nuclear Fuel Development Corp. (Donen) Tokai Works in Tokai village led the plant to halt operations of two other concrete-reinforced dissolvers in the plant for safety precautions, officials said. The facility is located on the Pacific coast about 100 kilometers north of Tokyo.

Donen officials said they are investigating the cause of the trouble and it would take several days to complete the work.

It was the first automatic shutdown of the nuclear fuel dissolver at the plant since the facility went into operation in 1977, the officials said.

A preliminary report released by Donen officials said air pressure in one of the three cylindrical-shaped tanks rose suddenly at around 5:58 P.M. Friday, automatically stopping its operation.

The tanks, measuring 3 by 6 meters, are shielded with concrete walls 1.5 meters thick.

No radioactivity leakage was reported or pollution caused to the surrounding environment, Donen officials said.

Barometric reading inside the dissolver involved in the automatic shutdown suddenly rose to 1.18 atmospheres from the normal pressure of below 1 atmosphere, apparently because of an abrupt increase in steam and gas in the tank, they said.

The vessels are used to separate uranium and plutonium from spent nuclear fuel. They are heated from outside to raise the temperature inside to 105 degrees Celsius to activate the chemical reaction necessary for the dissolution of the spent nuclear fuel.

Donen officials said the tanks' operations were usually shut down manually when high air pressure was noticed, but the rise of pressure in the dissolver that stopped automatically Friday was too quick for manual control.

Oil Pump Flaw Shuts Down Nuclear Reactor

OW2102133491 Tokyo KYODO in English 1128 GMT 21 Feb 91

[Text] Niigata, Feb. 21 KYODO—A nuclear reactor in central Japan facing the Sea of Japan came to an automatic halt Thursday when pressure suddenly fell in an oil pump that lubricates the plant's turbine, Tokyo Electric Power Co. said. No radioactivity leaked in the incident at the No. 2 reactor at the Kariwa nuclear power complex in Kashiwazaki, Niigata Prefecture, and the reactor itself was not affected, company officials said.

The reactor shut down about 12 minutes after an alarm signaled a drop in oil pressure in the pump at 6:12 A.M., the officials said. The pressure dropped to 7.4 kilograms per square centimeter from the normal 14 kilograms, forcing the turbine to automatically stop to prevent it from overheating. This was followed by an automatic shutdown of the reactor to prevent pressure there from rising. Officials said they are trying to determine what went wrong with the pump.

This was the first shutdown at the 1.1 million kilowatt boiling water reactor, which went into commercial operation in September last year. The trouble-stricken reactor is one of three reactors now in operation at the Kariwa nuclear power complex. Two more are now under construction, with yet another two under consideration. If all seven reactors are built, the complex would produce a total of 8,212 million kilowatts of electricity.

There have been about 30 shutdowns of boiling water type reactors in Japan due to problems in the turbine system, according to the Natural Resources and Energy Agency, affiliated with the Ministry of International Trade and Industry.

Radioactive Gas Leaks at Tokai Nuclear Institute

OW2702092491 Tokyo NHK General Television Network in Japanese 0300 GMT 27 Feb 91

[Text] Gas containing radioactive matter has accidentally leaked at the Tokai Research Institute of the Japan Atomic Energy Research Institute [JAERI] in Tokai Mura [village], Ibaraki Prefecture, contaminating a part of the facility.

The accident occurred at a facility for testing safety of radioactive waste at the JAERI Tokai Research Institute. The institute had switched on emergency power to upgrade a generating plant facility. On 23 February, at about 1300, the power source was suddenly cut off, causing the air-conditioning facility to stop. Consequently gas containing cesium and other radioactive matter leaked from a special compartment into a work area, thus contaminating a part of the facility with radioactivity.

The facility in question conducts research to find safe ways of storing high-grade radioactive waste generated from the reprocessing of spent nuclear fuel. The JAERI

said that the radioactive matter had not leaked outside the facility and that the neighborhood residents, as well as employees of the facility, were not affected.

NORTH KOREA

U.S. Holds 'Another Nuclear Air Strike Exercise'

SK0803051991 Pyongyang KCNA in English 0443 GMT 8 Mar 91

[Text] Pyongyang March 8 (KCNA)—The U.S. imperialist aggressors on March 6 staged another nuclear air strike exercise against the North with the Korean Peninsula as its operational theatre, according to military sources.

The two rounds of provocative war games in the skies above Kongju, Kangrung and Kunwi in South Korea involved formations of nuclear-capable F-15 fighter-bombers brought from the Kadena base in Japan for the "Team Spirit 91" joint military exercises and scores of F-16 fighter-bombers of the U.S. 7th Airforce present in South Korea.

On the same day, the U.S. imperialists let formations of Guam-based KC-135 refuelling tankers fly above Chongup in an exercise for mid-air refuelling of more than 30 fighter-bombers and observation planes.

They also brought formations of C-141 and C-130 transport planes carrying huge aggression forces for the "Team Spirit 91" joint military exercises to the Osan Airfield from the U.S. mainland and bases in the Pacific.

On the same day, they brought an EC-130 reconnaissance plane to the sky above Samchok and Pyongtaek from the mainland and let it make repeated flights for an aerial espionage on targets in the depths and wide areas of the Northern half of Korea.

At the same time, with the full-scale offensive stage of the "Team Spirit 91" joint military exercises near at hand, they introduced scores of formations of F-16, F-15, A-10, A-4, KC-10, KC-135 and other fighter-bombers, assault planes, tanker planes, transport planes, helicopters, electronic jamming planes and reconnaissance planes from the U.S. mainland and bases in the Pacific into the Osan, Kunsan and Taegu airfields. And they sent groups of combatant ships including a guided missile cruiser, a nuclear-powered submarine and guided missile destroyers to the South Korean waters and ports and keep them ready for sortie any moment.

NODONG SINMUN: Team Spirit 'Test Nuclear War'

SK2802112591 Pyongyang KCNA in English 1001 GMT 28 Feb 91

["Test Nuclear War Against North"—KCNA headline]

[Text] Pyongyang February 28 (KCNA)—The large-scale "Team Spirit" joint military exercises are a preliminary

war, test nuclear war against the northern half of Korea aimed at executing the U.S. imperialists' global strategy, says NODONG SINMUN today in a signed article entitled "Test Nuclear War Against North."

It says: The "Team Spirit" is a combined offensive war game which is being staged by the U.S. imperialists under a scrupulous plan to unleash a nuclear war in Korea.

They chose the Korean Peninsula as "an area of first priority" for the use of nuclear weapons and openly prattle that they do not rule out the use of nuclear weapons in case of war in Korea. It is clear that if a war breaks out in Korea, it will be easily escalated to a global nuclear war.

What the United States seeks is to light the train of a nuclear war in Korea, expand it to the continents and thus realise its wild ambition for world supremacy.

The U.S. imperialists are pretending to have got any stake in peace of Korea, raising a hue and cry over "disarmament" and "detente". This is a crafty ruse to realize their aggressive design without much difficulty by concealing the dangerous nature of their nuclear war moves and disarming people ideologically.

They do not hesitate to invade other countries, behaving more arrogantly and recklessly by taking advantage of the imbalance of forces in the international arena.

They ordered their Armed Forces stationed in South Korea into a top emergency alert posture and made the puppets declare an emergency wartime system in South Korea with the outbreak of the Gulf war.

The "Team Spirit 91" joint military exercises being staged under these circumstances are fraught with a latent danger of a war breaking out any moment.

In face of the obtaining situation the supreme commander of the Korean People's Army issued an order to the entire units of the Korean People's Army, the Korean People's Security Forces, all the members of the Worker-Peasant Red Guards and the Young Red Guards to take a position of combat mobilisation. This is a legitimate self-defensive step to counter the aggressive moves of the enemy.

The U.S. imperialists must stop at once the provocative "Team Spirit 91" joint military exercises and withdraw all their troops and nuclear weapons from South Korea.

Report of 'Nuclear Strike Exercise' in South

SK2702075691 Pyongyang KCNA in English
0644 GMT 27 Feb 91

[Text] Pyongyang February 27 (KCNA)—The U.S. Pacific Airforce Command staged one more aerial nuclear strike exercise in South Korea on Feb. 25 under the program of the provocative "Team Spirit 91" joint

military exercises, according to military sources. Mobilised in the aerial nuclear war exercise in the sky above Yoju and Chongju that day were formations of nuclear-capable F-16 fighter-bombers from Kadena Base, Okinawa, and F-16, F-4 and F-5 fighter-bombers, A-37 assault planes and OA-10 observation planes of the U.S. Airforce stationed in South Korea and the South Korean puppet airforce, more than 100 in all. The U.S. imperialists kicked up a racket, bringing to Osan and Kunsan Airfields formations of C-130 transport planes carrying aggressor troops and combat equipment from Japan and overseas bases in the Pacific and deploying them in the operational zone for the "Team Spirit 91" joint military exercises. They sent Guam-based KC-135 refuelling tanker to the sky above Taegu for the war exercise of refuelling in the air 28 F-16 fighter-bombers of the U.S. Airforce. On Feb. 25 and 26 U-2 high-altitude strategic reconnaissance plane and RC-12 and RV-1 tactical reconnaissance planes made shuttle flights between the east and west along the Military Demarcation Line for aerial photographing of the targets in our side's depth and frontline area. In separate action, the South Korean puppets staged a frantic ground and naval offensive operation exercises against the North supported by dozens of F-16, F-4, F-5, A-37 and OA-10 planes with a massive mobilisation of infantry and motorized units and combatant vessels on Feb. 25 in Uijongbu, Hwachon and Kapyong and in the West Sea of Korea. A total number of aircraft mobilised in the war exercises in the sky above South Korea on February 25 was more than 670.

Kim Yong-Sun on Nuclear Inspection

SK2502060791 Pyongyang KCNA in English
0519 GMT 25 Feb 91

[Text] Tokyo February 24 (KCNA Correspondent)—Head of the delegation of the Workers' Party of Korea [WPK] Kim Yong-sun, secretary of the WPK Central Committee, vice-chairman of the Foreign Affairs Committee of the Supreme People's Assembly [SPA] and deputy to the SPA, on a visit to Japan was interviewed separately by Japanese newspaper, news agency and television reporters in Tokyo on February 24.

Kim Yong-sun gave answers clarifying our stand toward the questions of normalization of DPRK-Japan relations, nuclear inspection, North-South dialogue, negotiations between the DPRK and the United States and other questions.

Giving impressions of his Japan visit, he said the WPK delegation on visit to Japan at the invitation of the Liberal Democratic Party and the Social-democratic Party of Japan met with a number of political figures and expressed deep thanks for the warm welcome and hospitality accorded it by Japanese people wherever it went. He stressed the need to strengthen friendship, exchange and cooperation between the two countries in the future.

Turning to the question of the normalization of the DPRK-Japan diplomatic relations, he expressed the

belief that today when the full-dress intergovernmental talks for the normalization of the DPRK-Japan diplomatic ties are underway, if delegations of the two countries hold the talks with sincerity in keeping with the desire of the two peoples, good results will be achieved.

With regard to the question of nuclear inspection, the head of the delegation stated that the DPRK has no intention and capacity to develop nuclear weapons. He recalled that the Workers' Party of Korea, together with the Social-democratic Party of Japan, made public a declaration on the establishment of a nuclear-free, peace zone in Northeast Asia in 1981 and has made consistent efforts to create a nuclear-free zone on the Korean Peninsula. Noting that the United States is now raising a hue and cry over the alleged development of nuclear weapons by the DPRK, he stresses that it is a false propaganda to keep more than 1,000 pieces of nuclear weapons in South Korea.

On the North-South dialogue, he said the South Korean side, in spite of our repeated advices, started the "Team Spirit-91" maneuvers increasing tension on the Korean Peninsula and bringing the dialogue to suspension.

He expressed the suspicion that a sinister design to put the brake on the early normalization of Korea-Japan relations under the pretext of tense situation lurks behind the "team spirit" exercises launched by the South Korean side, making the situation strained on the Korean Peninsula at a time when the door has opened for the improvement of DPRK-Japan relations.

On the question of the DPRK-U.S. relations, the head of the delegation said that the government of the Democratic People's Republic of Korea is ready to negotiate any time with the United States over a series of problems including nuclear inspection.

SOUTH KOREA

Soviet Visitor on Nuclear-Free Korea Prospects

SA2302091391 Seoul YONHAP in English 0831 GMT
23 Feb 91

[Text] Seoul, Feb. 23 (OANA-YONHAP)—Making the Korean Peninsula a nuclear-free zone is one of the Soviet Union's basic policies, and negotiations are actively under way with experts from the United States, Japan and China, a leading Soviet scholar said Saturday.

Mikhail Titarenko, director of the Institute of Far Eastern Affairs at the Soviet Academy of Sciences, told a press conference here that South Korea's economic experience will be helpful to Moscow.

The Soviet Government is planning to establish special economic zones not only in Nakhodka, as announced last year, but also in Sakhalin, Leningrad and Khabarovsk. But because of weak domestic substructure, such plans will need investment from Western countries, Titarenko said.

The Far Eastern scholar arrived in Seoul Friday at the invitation of Samsung Co. Chairman Sin Hyon-hwak. He will be meeting with researchers, businessmen as well as ruling and opposition party leaders during his stay, and he will also call on President No Tae-u before leaving March 1.

When asked whether the Korean Peninsula can be made into a non-nuclear region, Titarenko said it is one of the basic policies of the Soviet Union and is highly possible.

"There has not yet been inter-governmental talks on the issue, but the matter will naturally come up during discussions for establishing an Asia-Pacific cooperation conference as urged by Presidents No Tae-u and Mikhail Gorbachev or during talks on troop reduction in Asia," Titarenko said.

Commenting on Moscow's internal political tension and its possible negative effect in drawing South Korean investors, Titarenko claimed that the present difficulties are side results from pursuing perestroika.

Political and economic stability can be achieved, he said, and there shall not be any problems two years from now.

Japanese Offer To Mediate Safeguards Condemned

SA0503075791 Seoul YONHAP in English 0727 GMT
5 Mar 91

[Excerpt] Seoul, March 5 (YONHAP)—South Korean Prime Minister No Chae-pong lashed out Monday at former Japanese Deputy Prime Minister Shin Kanemaru's bid to mediate between the United States and North Korea in connection with the international inspection of North Korean nuclear facilities.

Talking with a group of Japanese reporters at his office, No said that the issue of Pyongyang's signing of the nuclear safeguards agreement was "not a matter for Japan to meddle with offhandedly."

"There is a call for the withdrawal of the U.S. Army from South Korea behind North Korea's arguments. North Korea tries to link all matters, including the nuclear affair, with a pull-out of the U.S. Army from South Korea," he said.

Kanemaru reportedly asked Kim Yong-sun, a senior official in the North Korean Workers Party, last week in Japan if he could mediate between Washington and Pyongyang on signing the nuclear safeguards accord of the International Atomic Energy Agency (IAEA). Pyongyang wants to discuss the matter with Washington, not Seoul. [passage omitted]

UN Action Requested on Atomic Energy Agreement

SK2602083391 Seoul YONHAP in English 0808 GMT
26 Feb 91

[Text] Seoul, Feb. 26 (YONHAP)—South Korea announced Tuesday that it has sent U.N. Secretary-General Javier Perez de Cuellar an official letter calling for North Korea to sign the International Atomic Energy Agency's [IAEA] nuclear safeguards agreement and has asked him to circulate it to member nations and the Security Council paper.

According to a Foreign Ministry announcement, the letter strongly calls for North Korea to fulfill the obligations of the Nuclear Non-Proliferation Treaty (NPT) and to voluntarily remove this stumbling-block for the progress of inter-Korean reconciliation and confidence-building by signing the safeguards agreement as soon as possible.

"Our government wants to draw attention to the fact that North Korea has not so far carried out the obligation of signing the IAEA nuclear safeguards agreement even though five years have passed since it joined NPT in December 1985," Ministry spokesman Chong Ui-yong said.

NPT member nations are obliged to sign the agreement within 18 months of joining.

The letter expressed serious concern about the possibility of North Korea developing nuclear weapons, and warned that North Korea's attempts to link its refusal to sign the agreement with political issues and to justify its position might endanger both international nuclear non-proliferation and the security of Northeast Asia.

"The suggestion we are making in the letter is for the United Nations to cope with North Korea's recent preposterous insistence on glossing over its objection to joining the nuclear safeguards agreement," a senior government official said.

North Korea claimed in a letter to the Security Council on Nov. 21 last year that its refusal to sign the agreement was not because of a dispute with IAEA but because of differences with the United States, he said, speaking on condition of anonymity.

The letter can be seen as a counterattack against North Korea's recent demand for simultaneous inspection of nuclear facilities in both Koreas.

The United States, Japan, Canada, Australia and Poland submitted appeals Friday to Perez de Cuellar calling for North Korea to sign the nuclear safeguards agreement. Neither Korea is a member of the United Nations.

IAEA Asks North To Sign Safeguards Accord

SK2702092291 Seoul YONHAP in English 0850 GMT
27 Feb 91

[Text] Seoul, Feb. 27 (OANA-YONHAP)—Sixteen of the 35 governors of the International Atomic Energy Agency (IAEA) called on North Korea to sign the IAEA's nuclear safeguards agreement during a board meeting Tuesday in Vienna, according to the South Korean Foreign Ministry Wednesday.

North Korea responded as usual, saying it would not sign the accord until the United States had promised not to launch a preemptive nuclear attack, the Ministry quoted Yi Chang-chun, South Korean ambassador to Austria, as reporting.

Attending the meeting with observer status, Yi said North Korea used the nuclear issue for political purposes and the IAEA governors will meet in June to decide whether to punish it for not signing the treaty, under which nuclear facilities must be opened to international inspection.

Government Asks IAEA for Sanctions on North

SK2802143291 Seoul CHOSON ILBO in Korean
28 Feb 91 p 2

[Text] Our country has officially requested the International Atomic Energy Agency [IAEA] to impose sanctions on North Korea if North Korea does not sign the IAEA Nuclear Security Treaty by June.

The Republic of Korea, the United States, and Japan have urged North Korea to sign the Nuclear Security Treaty. This is the first time, however, that our country has officially proposed that sanctions be initiated against North Korea.

North's Production, Export of Weapons Described

SK0103104491 Seoul HANGUK ILBO in Korean
26 Feb 91 p 15

[By reporter Yi Kye-song]

[Text] Interest is focused on North Korea's capability to produce weapons and on the scale of the weapons that are being exported to the Third World, amid the international dispute on whether North Korea has been supplying Scud missiles to Iraq.

From the mid-1960's, under the slogan of "self-reliance in national defense," North Korea has spent 20-25 percent of its gross national product for defense, giving priority to developing the war industry. As a result, in the late 1960's North Korea copied Chinese and Soviet made weapons, fully equipping ground forces with the basic firearms necessary. In the 1970's North Korea began to build ground weapons such as tanks, armored cars, and self-propelled artillery, and combat vessels such as submarines, naval destroyers, and speed boats.

In the 1980's North Korea began to develop and produce various up-to-date missiles such as anti-tank, surface-to-surface, surface-to-ship, ship-to-ship, and surface-to-air missiles. The main missiles that are being developed and produced by North Korea are the SA-7 surface-to-air missile, the AT-3 anti-tank missile, the Silkworm surface-to-ship missile, and the Scud-B missile, which is currently the subject of dispute. It was learned that since the SA-7 surface-to-air missile was introduced from the Soviet Union in 1974, up to 100 missiles were produced annually at the Chongyul arms plant from 1979. This missile has a range of 5 km and uses an infrared guidance system in which maximum speed is mach 1.5. This missile can be carried by an individual and can attack low altitude, low speed aircraft.

Other than these missiles, from the 1980's North Korea has been producing YAK-18 training planes and is currently producing parts for MiG-15 and MiG-17 fighters. Also, North Korea produces MI-2 helicopters, and there is a high possibility that in the mid-1990's North Korea will be capable of producing MiG-21 fighters from its fighter plant in Panghyon, which was completed in 1986.

North Korea was selling these weapons to Third World countries and supported military technology, thus regarding its military diplomacy as an important basis for its diplomatic policy.

In a U.S. congressional report last year, it was revealed that North Korea's export of weapons for four years from 1986 to 1989 amounted to \$2.18 billion, ranking seventh in the world following the Soviet Union, the United States, France, Great Britain, China, and West Germany.

Also according to a "1985 report on world military expenditures and weaponry dealings," which was drawn up in 1988 by the U.S. State Department, in 1985 North Korea's weapon exports amounted to \$380 million, amounting to 27.5 percent of North Korea's overall exports for that year.

North Korea's export of weapons is usually carried out through cash sales or loans under the pretext of the "anti-imperialist joint struggle"; there have been cases in which North Korea has supplied weapons free of charge. In the late 1960's North Korea mainly exported small firearms, trench mortars, small artillery, and various kinds of ammunition. However, in the 1970's it increased its export items to multi-rocket launchers, 122-mm field guns, anti-aircraft guns, torpedo speedboats, and high speed boats, and North Korea also expanded its exports to countries from Asia and the Middle East to African and Central and South American countries.

In the 1980's North Korea even started to export MiG fighters, tanks, and patrol boats. During the 8-year Iran-Iraq war it was learned that North Korea had sold weapons worth over \$1 billion to Iran. During this period, North Korea exported 100 Scud missiles to Iran,

and based on this fact there is suspicion that North Korea might have sold Scud missiles or components to Iraq through Iran during the ongoing Gulf war.

It was revealed that a North Korean SA-7 surface-to-air missile was used in the shooting down of a Nicaraguan airplane in Nicaragua by a Salvadoran leftist antigovernment armed organization in November 1989.

Other than weapons, North Korea is also dispatching military advisory teams to foreign countries or inviting foreign military personnel, thus exporting military technology and services through training.

Nuclear-Free Korean Peninsula Recommended

*SK1902042491 Moscow International Service in Korean
1100 GMT 13 Feb 91*

[From the "Focus on Asia" program]

[Text] A report released by the ROK-U.S. relations committee indicates that it is possible to withdraw U.S. nuclear weapons deployed in the ROK without causing a loss to the security of the ROK. This committee is known as an (?expert) organ which gives (?advice) to the Washington and Seoul administrations. A station commentator indicates that the question of nuclear weapons has been a source of tension on the Korean peninsula for a long time.

It is natural for Pyongyang to regard U.S. nuclear weapons deployed in the ROK as a threat to its security. On the other hand, Seoul, Washington, and Tokyo have distrusted the DPRK, which has not allowed experts from the International Atomic Energy Agency into its nuclear facilities. It has been reported that Pyongyang is ready to allow an international inspection team into its nuclear facilities if U.S. nuclear weapons are withdrawn from the peninsula. The DPRK has also held that the Korean peninsula should be turned into a nuclear-free zone.

Those who participated in writing the above report stated that this being the situation, for the ROK, declaring that there exist no nuclear weapons in its territory and presenting evidence showing no existence of nuclear weapons there is politically beneficial to it. If the United States withdraws its nuclear weapons from the south side of the peninsula such a declaration is possible. If such a measure is taken, the military and political situation in northeast Asia will be stabilized. At the same time, Pyongyang, as well, will have grounds to declare that it is ready to discuss the question of nuclear safety with Washington.

According to foreign press reports, in the DPRK-Japan talks held last January to discuss the normalization of relations between the two countries, the DPRK side asked Tokyo to play the role of mediator for talks with Washington on the nuclear issue.

Pyeongyang's proposal for turning the Korean peninsula into a nuclear-free zone has won support from many countries, including the Soviet Union and China, both nuclear powers. As it has already declared, the Soviet Union is willing to guarantee denuclearization of the Korean peninsula with other nuclear powers.

As the report of the ROK-U.S. relations committee properly indicated, Washington and Seoul have begun to accept the assertion that the Korean peninsula should be free from nuclear weapons. Of course, this is still nothing but experts' opinions. The problem lies in whether or not Washington and Seoul will officially accept the (?report).

Nuclear Plants Supply 49 Percent of Electricity

SK25020716 Seoul YONHAP in English 0547 GMT
25 Feb 91

[Text] Seoul, Feb. 25 (YONHAP)—South Korea's nine nuclear power stations generated electricity at a rate of 52.9 billion kilowatts per hour last year, supplying 49 percent of the nation's electricity at the lowest cost of all, the Energy and Resources Ministry said Monday.

Generation costs are tentatively tallied at 23.78 won (3.35 U.S. cents) per kilowatt an hour for nuclear power, well below the 26.42 won (3.72 cents) for coal and 29.99 won (4.22 cents) average for all energy sources.

Nuclear fuel cost 191 billion won (269 million U.S. dollars) for 264 tons on a processed basis, or 15 percent of the aggregate fuel cost of 1.241 trillion won (1.75 billion dollars).

Spokesman Chon Yong-taek said the ministry paid 241 million dollars for nuclear fuel last year, including 40 tons of enriched uranium from the Soviet Union. Concentrate fuel cost 73 million dollars, conversion and enrichment cost 96 million dollars and fabrication cost 72 million dollars.

Canada carried off 49 million dollars, the United States took 46 million dollars, the Soviet Union got 25 million dollars and Australia earned 18 million dollars. The other 73 million dollars was paid to Korean firms.

Chon said import prices for fuel and processing were almost double the current international price because long-term contracts extending from 10 to 30 years were signed near 1980, when supplies were tight worldwide.

TAIWAN

Hao Po-tsun's Comments on 4th Nuclear Plant

OW2202140591 Taipei CHINA POST in English
14 Feb 91 p 12

[Text] Both Kuomintang (KMT) and Democratic Progressive Party (DPP) politicians yesterday criticized Premier Hao Po-tsun's remarks asserting the necessity of constructing the 4th nuclear plant on Taiwan.

Legislators Jaw Shau-kong (KMT), Lu Hsiu-yi (DPP) and Taipei County Commissioner You Ching (DPP) said Hao's statement would not only bias the view of groups reviewing the plant's construction but would also violate requirements that such a decision be made only after environmental impact assessments are completed and studied.

The premier made the controversial remarks at a year-end press conference yesterday, saying the 4th nuclear plant must be built to improve the standard of living for the people of Taiwan.

Politicians protested the Cabinet's overt support of the project, claiming the review bodies would become the government's rubber stamp.

While supporting a referendum on whether to build the plant, You said any opinion pro or con should be expressed and fully discussed before a referendum is conducted.

Progress in Developing Fighter, Missiles

OW1303062491 Taipei Domestic Service in Mandarin
2300 GMT 11 Mar 91

[Text] The Chungshan Institute of Science and Technology revealed on 11 March that the initial work has been completed in the research and development of the Chingkuo fighter aircraft [indigenous defense fighter] and the first generation of various types of missiles, and plans are under way for their production. The total amount to be spent on this in the next 10 years is estimated at \$18 billion [New Taiwan Dollars]. Manufacturers in the country are going to play an active role in acquiring technology transfer and making accessories and parts for the military.

A representative from the research and development unit of the Chungshan Institute of Science and Technology pointed out at an 11 March discussion meeting with domestic manufactures on integration of the national defense industry: Currently, the annual amount of standard accessories and parts for military equipment purchased from government-owned and private factories through public bidding has reached \$1.2 billion [New Taiwan Dollars]. Special accessories and parts for military equipment purchased from abroad has amounted to \$630 million [currency not specified] per year. Nearly 600 suppliers are involved in the regard. Items like the Chingkuo fighter belong to the category of high-tech, sophisticated weapons and equipment. All accessories and parts must pass the military or aeronautical specification tests to ensure their reliability. However, most domestic products can only conform to the commercial specifications rather than meeting the military and aeronautical specifications. So, there is an urgent need to raise their technical standards.

BULGARIA

Construction of Belene Nuclear Plant Suspended

*AU2202095791 Sofia BTA in English 0858 GMT
22 Feb 91*

[Text] Sofia, February 22 (BTA)—The construction of the Belene nuclear power plant has been stopped, Prime Minister Dimitur Popov told the legislature yesterday in reply to a question. No funds have been allotted for its resumption, either.

Mr. Popov pointed out that the Power Engineering Committee will allocate a sum for the conservation of the project.

Financial Problems at Belene Nuclear Power Plant

*91WP0060A Sofia OTECHESTVEN VESTNIK
in Bulgarian 9 Jan 91 pp 1-2*

[Unattributed article: "The Hull of the Belene Reactor Is Rotting Not Far From Bratislava"]

[Text] Drops of water eventually make a pond, and one leva after another becomes a fat account in a Czechoslovak bank. How to correct the situation?

Several years ago, senior state officials of the Bulgarian and Czechoslovak Governments signed a contract according to which Czechoslovakia was to build the hull of the first reactor of the Belene AETs [Nuclear Power Plant]. The hull is ready and, for more than 12 months, has been sitting at the Bratislava Port. How long will it stay there, does anyone need it, and how much is this waiting costing us?

It is as though the fate of this equipment seems to be the least of the concerns of the responsible individuals in various departments. For example, the moment it became clear that I was interested in the hull, personnel of the Committee on Power Industry immediately assumed a cool attitude. It was as though I was asking them to drink castor oil. I was shunted from one official to another, until I ended up with Engineer Nikita Nabatov, general director of the Nuclear Power Industry Investment Enterprise in Belene. He assumed the role of Hercule Poirot, making sure that I was indeed calling from Sofia because he had been frequently provoked by opponents of the nuclear electric power plants in Svishtov and Belene. The so-called compromise protocol was adopted on 26 February 1990. It defined the way the building of Belene was to take place until the problem could be finally resolved by the Grand National Assembly. In other words, the burden of responsibility was shifted from one shoulder to another. Part of the construction (buildings for cultural and consumer requirements) was continued. However, the basic sub-projects were frozen. The protocol recommends that the hull of the reactor should not be transported. It, too, should wait for the "sentence" to be passed by the

people's representatives. Its exact price is 24,028,409.27 leva. No one would be crazy enough to provide us warehousing facilities and guards out of friendship. Between April and October of last year, we paid 144,257 rubles for insurance, warehousing, security guards, and so forth. Again, last year, in November, we paid another 30,453 rubles, which included a press conference, one such being held once every six months. So far, the additional funds spent on the reactor's hull have totaled 174,710 rubles.

Here is a small detail: I learned from Georgi Shumanov, head of the Power Industry Administration of the Tekhnoimporteksport Commercial Enterprise, that they still had not received their bills for November and December 1990. This means that the amount we mentioned will be higher. Another important and rather alarming detail is the following: Starting in January 1991, payments will be made in convertible currency. So far, the rate of exchange to the dollar has not been established. One thing, however, is quite sure: Those green bank notes will be piling up in the respective Czechoslovak bank, while we keep wondering what to do about the Belene AETs. Meanwhile, Czechoslovakia is justifiably pressing us to move out this 323-ton piece of equipment that occupies a substantial area in the port of Bratislava and is hindering its operations. They will have to wait, however, because, the way things are going, this matter will not be resolved very soon. Our deputies are up to their necks in important problems, and it would not surprise me if "domestic problems," left over from their predecessors, will be taken up by the new deputies, who will possibly enter parliament in May. Meanwhile, the Belene AETs has been the target of a serious "study." Several expert reviews have been made. The conclusion of the specialists (foreigners who are both able and willing) is that the construction of the power plant should be continued, naturally in accordance with some instructions. On 14 January, a new expert evaluation was started by MAGATE, based on the VVER-1000 Project. Here is yet another bit of information to consider: So far, about 1 billion leva have already been spent on this nuclear power plant—that is, 40 percent of the cost of the first reactor. The way things are going, our national debt (if such money is not put to use) will increase. Can we correct this situation? We can. According to the specialists, if the state is unable to allocate the necessary funds to finance the Belene AETs, foreign capital should be invested, the more so because interest in this project is shown by companies in Czechoslovakia, by Siemens, and by others.

CZECHOSLOVAKIA

World Chemical Disarmament Promoted

*LD2002223891 Prague CTK in English 1545 GMT
20 Feb 91*

[Text] Prague Feb 20 (CTK)—General Josef Cerny, the chief of the Czechoslovak Army's chemical units, confirmed Czechoslovakia's active share in the process of chemical disarmament in the world at a regular Army briefing here today.

Cerny recalled Czechoslovakia's document containing detailed data about the production, consumption, import and export of substances relevant to the chemical weapons convention. No other country except the USA and the USSR has so far presented such a document.

Cerny said that Czechoslovakia's approach to the talks on a chemical weapons' ban was motivated by the results of Soviet-U.S. talks on publishing data about chemical weapons, and by the opinion that countries need not keep secret their capability to produce a poisonous substance. Czechoslovakia is capable of producing chemical weapons but does not own chemical weapons and has never given or shown anybody the production technology. Cerny said these substances are produced for industrial, scientific and medical facilities, both military and civilian.

Foreign Firms Invited To Bid on Nuclear Plant

AU2102124291 Prague SVOBODNE SLOVO in Czech
18 Feb 91 p 3

[Unattributed report: "Emphasis on Security"]

[Text] Recently, foreign firms have been invited to submit tenders for the construction of a new nuclear power plant in Czechoslovakia. According to information provided to a CTK reporter by J. Novak, Czech Electric Power Plants (CEZ) department chief, after the first and second units of the Temelin nuclear power plant

are finished, the construction of two new units is planned. In the bid for a contract, the CEZ strongly stresses that nuclear safety [measures] should meet the levels required after 2000. Requests for bids for a contract have been sent to the following companies: General Electric, Westinghouse, and Bechtel from the United States, Japanese Mitsubishi Heavy Industries, Italian Ansaldo, French-German Nuclear Power International, and, furthermore, to ABB [expansion unknown] and to the Skoda Plzen concern.

YUGOSLAVIA

Hungarian Arms in Croatia Possibly Radioactive

LD2102183191 Belgrade TANJUG Domestic Service
in Serbo-Croatian 1744 GMT 21 Feb 91

[Text] Belgrade, 21 Feb (TANJUG)—TANJUG has learned that commands and units of the Yugoslav People's Army have received specific specialist instructions to take strict inspection and protection measures in the event of weapons being handed in to them which the Republic of Croatia imported illegally from Hungary for the purpose of arming paramilitary formations.

It is claimed, some public information media have reported, that these weapons have been exposed to radiation and that people armed with them are reporting the first symptoms of radiation sickness.

ARGENTINA

Scientists To Conduct Enriched Uranium Experiments

PY1301024491 Buenos Aires NOTICIAS

ARGENTINAS in Spanish 1938 GMT 12 Jan 91

[Text] Rio de Janeiro, 12 Jan (AFP-NA)—In the first half of 1991, Argentina and Brazil will conduct joint experiments for the sale of enriched uranium, according to the weekly RELATORIO RESERVADO published on 12 January in Rio de Janeiro. The report, which was neither denied nor officially confirmed by any Brazilian agency, was attributed by RELATORIO RESERVADO to "an adviser to President Collor de Mello," whose identity was not revealed.

Argentina will manufacture zirconium alloy tubes that will serve as containers for enriched uranium pellets, which are the fuel in Brazilian nuclear plants, said the source mentioned in the weekly RELATORIO RESERVADO. In 1990, Argentine and Brazilian experts worked together for six months to prepare the project, and in 1991, the quality of the materials to be used in the project will be tested, the source added.

The Brazilian-Argentine nuclear cooperation agreement signed in 1990 is making possible implementation of this project, which, if successful, will allow Brazil to pay in 10 years the debt it contracted to execute its nuclear program under the agreement signed with the FRG in June 1975 (more than \$4 billion), the source indicated.

Brazil and Argentina signed the first bilateral nuclear cooperation agreement in May 1980, after the two countries had worked out an agreement reconciling their interests in hydroelectric use of the Parana River. On 28 November 1986, a committee was created to coordinate a program for the integration of nuclear activities between the two countries so that Brazilian and Argentine nuclear sector companies could jointly supply third countries.

The nuclear programs developed by Brazil and Argentina differ in the fuel that each one uses. While Brazil uses enriched uranium for its nuclear plant fuel, Argentina uses natural uranium.

Gonzalez Says Condor-2 Prototype 'Never Built'

PY0603133691 Madrid EFE in Spanish 1759 GMT

5 Mar 91

[Text] Cairo, 5 Mar (EFE)—Argentine Defense Minister Erman Gonzalez said in Cairo today that his country never built the Condor-2 ballistic missile that was supposed to have been built with Iraq and Egypt, but only developed the technology for it. The research to develop such a weapon has been totally halted by Carlos Menem's government, Gonzalez said during a news conference. The minister denied the existence of any cooperation agreement with Arab countries to develop nuclear weapons.

Erman Gonzalez met with his Egyptian counterpart Yusuf Sabri Abu-Talib to discuss matters of common interest regarding the Persian Gulf crisis in which Argentina participated with two corvettes.

Gonzalez said: "Argentina has officially decided to totally abandon any such research or development of technology for war purposes."

"Argentina's missile program is restricted to the development of technology, meteorology, atmospheric studies, and medical research," the minister said.

Gonzalez denied that Argentina has sold arms to any Arab country stating that his country "is more interested in peace than in war." Gonzalez added: "We are determined to make Egyptian President Husni Mubarak's statement on clearing the Mideast region of the production of nuclear or atomic reactors for belligerent purposes come true, and we contemplate cooperating to that effect."

In the United Arab Emirates the Argentine minister will attend ceremonies to relieve one of his country's corvettes by another that will bring food and medicine for the Kuwaiti people, in keeping with agreements made with the United Nations.

Erman Gonzalez told EFE: "Our contingent experienced no problems during its stay in the Gulf, where it helped enforce the economic embargo decreed by the UN Security Council."

About the commitment to send a military contingent to the Gulf during the past crisis, Erman Gonzalez affirmed: "Important historical ties link us to the Arab nations; therefore, we made a commitment to cooperate for the most rapid liberation of Kuwait."

The minister indicated that "the Persian Gulf crisis has economically affected our country a great deal, causing the loss of important markets for our products, particularly our agricultural products."

Accompanied by the Navy Joint Staff Chief Jorge Ferrer and other Argentine military chiefs, Minister Erman Gonzalez departed for Damascus, where he will meet with his Syrian colleague and be briefed on the conclusions of the Arab foreign ministers meeting in that capital.

BRAZIL

Argentine Scientists To Inspect Nuclear Sites

PY1001214491 Sao Paulo O ESTADO DE SAO

PAULO in Portuguese 6 Jan 91 p 21

[Rubens Santos report]

[Text] Brasilia—The Agreement on Safeguards in the nuclear sector signed between Brazilian President Fernando Collor de Mello and Argentine President Carlos Menem in November 1990 will yield its first

result tomorrow. A group of Argentine scientists will land in Rio de Janeiro for a historic inspection of Brazilian nuclear installations, equipment, and all existing fissionable material. Brazilian scientists, in their turn, will go to Argentina on 14 January for a reciprocal inspection.

Through the Agreement on Safeguards, the two countries agreed to open their nuclear installations for mutual inspections. This is the method found by the two presidents to eradicate the distrust that exists between the two parties and to do away with the international suspicion that the two countries are developing technology to manufacture nuclear weapons such as the atomic bomb.

The agreement signed last year began long before then. The first rapprochement in this regard took place during the government of General Joao Figueiredo in 1980. The first protocol for exchange in the nuclear sector between the two countries was consolidated during the government of Jose Sarney in 1987. The difference between previous actions, the protocol, and the current agreement is that Brazil and Argentina will carry out inspections of their respective installations, an important step toward a consolidation of safeguards—some sort of accounting of the stocks of fissionable material, equipment, and installations existing in the two countries.

A system of safeguards, a demand in the nuclear sector, was established throughout the world at the end of World War II. The United States and later, the Soviet Union and Great Britain expressed their concern about the need to establish international controls to guarantee nuclear development without the risk of weapons proliferation. As a result, the International Atomic Energy Agency (IAEA) was created. This group organized a system to establish controls, which are called safeguards.

This objective, which is universal and does not discriminate, has lived through a long, painful experience. It was later split into other processes, such as the nuclear weapons Nonproliferation Treaty (NPT), under the control of the industrialized countries, which are still disputing the arms race. The names and actions have been different over the past three decades. In the case of Latin America, the Tlatelolco Treaty signed in Mexico in 1967 was a document issued in such a manner as to prevent discrimination. Its overall application depends on ratification by other countries, such as France, which although not part of Latin America, has some jurisdiction in the region due to Guyana.

A third type of safeguards in the nuclear sector was tested between the end of the 1940's and the beginning of the 1950's with the so-called Bilateral Controls; however, these controls encountered tremendous difficulties during that period. According to assessments by nuclear experts, the new agreement between Brazil and Argentina abolishes all possibilities for distrust and discourages possible pretexts for nuclear proliferation in the Southern Cone.

Piva Says Defense Weapon Sold to Iraq

91SM0194A Sao Paulo FOLHA DE SAO PAULO
(Special Supplement) in Portuguese 19 Jan 91 p 5

[Interview with Brigadier General Hugo Piva (Res) by Ricardo Julio; place and date not given]

[Text] Brig. Gen. Hugo Piva, who is in the reserves and is the owner of the HOP [Hugo de Oliveira Piva] enterprise, which produces war materiel, believes that it will be difficult for the United States to occupy Iraq, despite the technological superiority of its weaponry. But he thinks this may favor the U.S. strategy, because it would suggest that its troops should remain in the Persian Gulf area for a lengthy period of time. In an interview granted to FOLHA, Piva, who has supplied Iraq with weapons, spoke further about the Brazilian weapons involved in the war.

[Julio] What chance does each side have in the war?

[Piva] Wars are always decided by technology, but they are won by force. This is a contradiction. The United States is in a position to destroy Iraq completely within a rather short time. Now, it is going to be much more difficult to occupy Iraqi territory. There may be guerrilla forces in the urban areas and in the desert, where the Americans enjoy little advantage. Also, there is the problem of lack of support from the population, which would make occupation difficult. The United States has already had the example of Vietnam, and the Soviet Union has the example of Afghanistan. Both countries succeeded in destroying the resources enabling the enemy to attack, but they did not succeed in occupying the enemy's country.

[Julio] Would this make for a long war?

[Piva] It depends on how the parties react. It would not be long if the United States were to be satisfied with simply destroying the Iraqi war machine, which it can do within a short time, and which it is in its interest to do in order to prevent the great threat of Iraqi hegemony in the future. In such a case, the Americans could occupy Kuwait, which is a small area, thus creating a state of tension which would require that they remain in the Gulf area for a long time. This is what they want—to have a firm position in the Gulf. Continuing this state of tension in order to stay in the Gulf for a long time creates a situation favorable to the United States.

[Julio] Do you believe that the United States wants to remain in the Gulf region permanently?

[Piva] Without any doubt. There they have the empire of oil, of which they have considerable need. The United States is the largest importer of oil in the world. They lost Iran with the fall of the shah, and now they are seeking a position in the Gulf. If the war should spread, the conflict could take on very large proportions in terms of human lives and material destruction. This could result in widespread terrorism.

[Julio] Who has supplied Husayn with chemical weapons?

[Piva] This has not yet become really clear. It appears to have been France and Germany.

[Julio] What importance have Brazilian weapons had for the Iraqi forces?

[Piva] The Astros system has some. But the importance of all these units is very limited compared to the other types of weapons available to Iraq. We have supplied these armored cars, but they are used for troop transport and do not decide the outcome of a war. We have the Cascavel, an armored reconnaissance resource, but it does not decide the outcome of battles either.

[Julio] What about the missile your team was manufacturing? What special characteristic would it have in relation to the weapons Husayn already has?

[Piva] Its special characteristic is that it was a rather small missile, with a range of 8 to 10 km for air-to-air attack. It is not essentially an attack weapon. It is a defense weapon, like the hundreds which Iraq already has and could purchase from other countries.

[Julio] If Iraq could buy from other countries why was the Brazilian missile of interest to Saddam?

[Piva] The fact is we did not go there to produce the missile. We were teaching them to do research and development. Because it is an air-to-air missile, it is a rather complex mechanism, and its structure involves almost all of the problems a missile might have. It is launched from a mobile platform, an airplane in the process of maneuvering, against another fleeing aircraft. Therefore it has to have special characteristics and intelligence to detect the slightest movements and to reach its target.

[Julio] Did you have the support of the Brazilian Government in developing this program for Iraq?

[Piva] I did not have formal authorization, but the government knew of it. I informed the Ministry of Aeronautics, at the time, and there was no opposition. The Itamaraty Palace also knew of it. Nothing was done secretly. The Brazilian Government did not have to give formal authorization to a private group going abroad to carry out a mission as part of an international transaction. In addition to this, not only has the government never caused me any problems, but it also provided me with support when I needed to withdraw the group from Iraq.

[Julio] With the technology you took to Iraq, could it develop atomic weapons?

[Piva] There is no connection. Our research in the missile field is unrelated to nuclear energy.

[Julio] Does Iraq have atomic weapons?

[Piva] I do not think so. It is not an easy thing to obtain nuclear weapons.

[Julio] But Husayn has said that he will surprise the world, in the event of war, with a powerful weapon. Of what is he speaking?

[Piva] I have no idea. He could mean chemical weapons, which in themselves are sufficiently devastating.

[Julio] Can Brazil profit economically from the war?

[Piva] No. It can only lose, because we must import more oil. It is always the Third World which pays the bills for the harm done by the developed nations.

[Julio] What about the war industries?

[Piva] We Brazilians would not profit, because the weapons we have are low destruction-density weapons. They are merely tactical weapons.

[Julio] What will the main consequences of the war be for Brazil?

[Piva] Fuel rationing and the increase in the price of oil will be the least important. In a war, crises spread and reflect on the Third World. The rope around our neck will be tightened. The great powers control the entire raw-materials market, and these are the products of which the Third World sells the most.

Piva Offered Nuclear Bomb Project to Iraq in 1981

PY2402233091 Sao Paulo FOLHA DE SAO PAULO (Second Section) in Portuguese 22 Feb 91 p 4

[By RL]

[Text] Brigadier Hugo de Oliveira Piva's proposed to develop two missiles for Iran is his fourth major initiative in the Middle East, although it is not the most ambitious one. In the first six months of 1981, while he was still an air brigadier on active duty, Piva offered the Iraqi Government two projects: one for an atomic bomb and another for a missile capable of carrying a nuclear warhead.

The brigadier's negotiations with an Iraqi military delegation took place in a room in a local SNI (National Intelligence Service, which was dismantled last year and replaced by the Strategic Affairs Secretariat) office in the old Finance Ministry headquarters in downtown Rio de Janeiro. The negotiations were supported by General Octavio Medeiros, retired, who was SNI chief at the time.

Medeiros appointed Colonel Luis de Alencar Araripe to participate in the negotiations on his behalf. Col. Araripe was the nuclear expert [preceding word in English] for the SNI Central Agency (in Brasilia). The members of the Iraqi delegation were suspicious, however, because they had received a similar proposal in 1980 from Engesa [Specialized Engineers, Inc.], the Sao Paulo

armored vehicle manufacturer. The proposal had been an amateurish, shaky project about which the government in Baghdad had sternly complained.

In 1981, however, the idea was no longer being sponsored by a private company, but by the Brazilian Government itself. Piva planned to offer the Iraqis a version of the Sonda-3 rocket. The rocket was being developed by the Sao Jose dos Campos Aerospace Technology Center (CTA) within the framework of a program with allegedly peaceful objectives that was being controlled by the Aeronautics Ministry.

Engineer Ozilio Carlos da Silva, the Embraer [Brazilian Aeronautics Company] trade director at the time, who was also a personal friend of Piva, took part in the negotiations, which the Iraqi military gave up a short while later. Sometime later, Ozilio da Silva became Embraer superintendent and in 1989, he offered the Iraqi Government, together with Brigadier Piva, a spy satellite project (this was also rejected by the Baghdad Government).

Retired Officer Proposes Missile Deal With Iran

PY2402013091 Sao Paulo FOLHA DE SAO PAULO (Second Section) in Portuguese 22 Feb 91 p 4

[By Roberto Lopes]

[Excerpts] Three and a half months after managing to pull his team of 21 engineers out of Iraq—engineers reportedly hired by the Iraqi Government to build an air-to-air missile—reserve Brigadier Hugo de Oliveira Piva, Brazil's most well-known missile expert, has secretly returned to the Middle East.

FOLHA DE SAO PAULO has discovered that Piva left a proposal at the Iranian Ministry of Military Industrialization [name as published] a few weeks ago to advise that ministry's missile group of the development of two projects: a missile with a range of 600 km, which was Iran's primary objective at that time; and another more sophisticated missile with a range of 1,000 km. [passage omitted]

Piva has already given Iranian officials the names of two Brazilian civilian engineers who will assist him in the project if his offer is accepted: Celso Leal Mariuzzo and Carlos Eduardo Santana.

As far as FOLHA could ascertain, Hugo Piva got in touch with the Iranian Ministry of Military Industrialization through a middleman named Kootlughloo [as published], a Turkish citizen who lives in Geneva, Switzerland. Piva was scheduled to hold another meeting with Iranian officials on 14 February but the meeting was postponed.

In his proposal to the Iranians, Piva indicated that the two missiles would be developed in Iran. He also mentioned the possibility of employing for this task all 20 engineers who work for his consulting firm, HOP [Hugo

de Oliveira Piva], which has its headquarters in Sao Jose dos Campos (95 km from Sao Paulo). These engineers are the same ones he used in Iraq between September 1989 and September 1990. [passage omitted]

Mariuzzo, a high-ranking official of the Sao Paulo company Orbita, is an old acquaintance of Brigadier Piva. It was with him that Piva began to develop the Brazilian "Piranha" missile at the Aerospace Technology Center (CTA) in Sao Jose dos Campos in the seventies. The development of this weapon turned into a long story with a sad ending. [passage omitted]

Rezek Says Chemical Weapons Treaty Nearly Ready

PY1902181791 Sao Paulo FOLHA DE SAO PAULO in Portuguese 17 Feb 91 p 12

[From the Brasilia Office]

[Text] Foreign Minister Francisco Rezek has announced that Brazil and Argentina have almost finished drafting a treaty forbidding the production and use of chemical and biological weapons. He believes that Uruguay, Paraguay, and Chile will "probably" also sign the treaty. "There is no reason to wait for a treaty to be drafted abroad because we know very well what we want," he said.

In the foreign minister's opinion, the treaty will be finished in the next few months. The decision to write this treaty is a result of the talks held among the Latin American countries that "have never before enjoyed better relations," he said. The pacifist attitude of the Latin American countries makes the transfer of high technology from the developed countries easier. [as published]

Rezek Views Policy Issues

PY1902154091 Sao Paulo FOLHA DE SAO PAULO in Portuguese 17 Feb 91 p 12

[Text] Foreign Minister Francisco Rezek, 47, has told FOLHA that the Third World-minded foreign policy has been abandoned because "its rhetoric has proved to be ineffective." For Rezek, "the Collor plan on foreign policy is to convey the country's desire to sit at the table with the First World countries to work" for solutions that will aid development. The objective is "to participate in the center of international decisionmaking as soon as possible," Rezek added.

The Brazilian foreign minister said the view of international issues through the Third World lens, more loudly expressed by the Nonaligned Movement, "frequently inspired strong complaints that were heard by nobody." He rejects the characterization of the current foreign policy as "First World-oriented," alleging that such a characterization is even more inaccurate with the changes taking place today in Eastern Europe.

The minister mentioned some of the successes of his administration which, he said, is leading Brazil toward

the desired objectives. One success is the clarity brought to the nuclear issue by the joint commitment made with Argentina to accept independent supervision and to adhere to international agreements. He stressed President Collor's stance against nuclear explosions, "even for peaceful purposes." The nuclear issue is critical for Brazil's access to advanced technology.

In the economic area, which is crucial to Brazil's access to First World decisionmaking, Rezek said the major responsibility falls on the Economy Ministry. Foreign debt negotiations with the creditor banks—which have still not been completed—fall under the jurisdiction of that ministry.

Minister Rezek affirmed that a foreign debt agreement is being delayed because of Brazil's desire to sign an agreement that is definitive and realistic, a desire that might not be shared by the creditors.

As for Brazil's stance on the Gulf war, Rezek said "Brazilian society broadly supports" the decisions made by Itamaraty, "which have not been criticized in official spheres at any time."

U.S. Ambassador to Brazil Richard Melton has said that "the constructive voices that will be heard after the war will not be the voices of those who are not involved in it now." Rezek noted that Itamaraty has direct communications with the State Department.

Minister Rezek said the United Nations' method of operations should be modified after the Gulf war. As one

alternative, he mentioned the possibility of enlarging the Security Council by creating a category of permanent members without veto rights. The Security Council could keep the five permanent members with veto rights and the ten temporary members, and then add six permanent members without veto rights. These six new members could be Brazil, the FRG, Japan, India, and two African countries.

PANAMA

U.S. Reportedly Dumping Nuclear Waste off Coast

PA2002162691 Panama City EL SIGLO in Spanish
19 Feb 91 p 5

[From the "Leaks and Tips" column]

[Text] Radioactive Abyss

Did you Panamanians know that one of the four deepest ocean abysses was located off the coast of Panama? We did not know this either, but it is located in the Parita Gulf on the Pacific side. Anyway, residents of the area have condemned, in front of our offices, U.S. military vessels for dumping large cement blocks in that area. The cement blocks presumably have radioactive waste material from nuclear plants in the United States. We are investigating the validity of this news. We also just received another report from a physics expert, which we will shortly make public.

PALESTINIAN AFFAIRS

'Arafat Warns of Chemical Weapons Use

LD2502084491 Madrid Domestic Service in Spanish
0800 GMT 25 Feb 91

[Text] PLO leader Yasir 'Arafat has told RNE that Spain's stance on the Gulf conflict has damaged Spanish-Arab relations. 'Arafat also predicted that the war will be long, and he did not rule out the use of chemical weapons.

[Begin 'Arafat recording in English with superimposed Spanish translation] It is clear that the U.S. troops and their allies have used napalm; they have acknowledged this; and it is prohibited internationally. It is an unconventional weapon. The British and the Americans especially are talking of using the tactical nuclear bomb. For this reason we must work with determination, because this may be a real catastrophe, a real disaster. Not only against Iraq, against all Arabs, against the peoples of the Middle East, but against the whole world. This is not a picnic. [end recording] That is an excerpt of an interview with the Palestinian leader recorded somewhere in Tunisia under impressive security measures.

AFGHANISTAN

'Sakr-Type' Missiles Fired at Kabul

LD0902150391 Kabul Domestic Service in Pashto
1430 GMT 9 Feb 91

[Text] The warmongering extremists have martyred today one of Kabul's citizens and injured another by firing surface-to-surface missiles at residential regions. The BAKHTAR INFORMATION AGENCY military section reported that the missile fired today, launched from a northeasterly direction, hit residential regions of Ward 10, caused material losses as well.

These missiles were Sakr-type U.S.-made missiles, which were put at the disposal of the warmongering extremists by the militarists of Pakistan, against all international norms, for the massacre of our Muslim and religious people.

INDIA

Signing of Nuclear Pact With Pakistan Reported

91WD0497 Madras THE HINDU in English 28 Jan 91
p 9

[Article by Kesava Menon: "Non-Attack on Nuclear Facilities: Indo-Pak Accord"]

[Text] The High Commissioner of India in Pakistan, Mr J.N. Dixit, today deposited the instruments of ratification of the agreement on prohibition of attack on nuclear installations and facilities, with Pakistan's Acting Foreign Secretary, Mr Afzal Qader. The Foreign Secretary,

Mr Sharyar M. Khan, has accompanied the Prime Minister, Mr Nawaz Sharif, on his tour of West Asia.

Article two of the agreement specifies that the two countries would inform each other the latitudes and longitudes of the nuclear installations and facilities in their respective countries at the beginning of each year, and would inform each other of any changes in locations.

Though India was prepared to submit the detailed list right away, Pakistan has preferred to stick to the letter of the agreement and the lists would hence be exchanged on 1 January 1992. This does not preclude an exchange of lists before this date.

It was also explained that Article one, which prohibits a direct or indirect attack on nuclear facilities is comprehensive and effectively precludes any breach of agreement by either side acting under the pretext of being insufficiently informed.

In his message, Ghulam Ishaq Khan said "I am confident that through sincere efforts and with perseverance, Pakistan and India can enhance mutual trust and achieve the shared objective of establishing tension free and good neighbourly relations. Working towards that end will not only benefit our two peoples but will also contribute to peace and stability in our region."

Mr Nawaz Sharif said "I take this opportunity to reiterate Pakistan's desire for improving relations between our two countries. We must address all our problems sincerely and work together ceaselessly for the creation of an environment in which our people can devote their energies to the pursuit of socio-economic development."

Pakistan Said Pursuing Nuclear Weapon Program

BK2302091191 Delhi Domestic Service in English
0240 GMT 23 Feb 91

[Text] India is of the view that Pakistan is pursuing a clandestine and weapon-oriented nuclear program. In this connection, the official sources in New Delhi have referred to the claims made by the Pakistan Nuclear Energy Commission chief, Mr. Munir Ahmed, that Islamabad does not process or intend to produce nuclear bombs. The sources said that the statement by itself does not suggest any amendment in Pakistan's nuclear policy.

No Question of Indo-Pakistan Nuclear War

91WD0496 Bombay THE TIMES OF INDIA
in English 24 Jan 91 p 12

[Article by A. M. Vohra: "Covert Nuclear Status Suits India"]

[Text] The prime minister, Mr Chandra Shekhar, assured the members of the Defence Consultative Committee of Parliament on 18 December 1990 that the government was fully aware of Pakistan's nuclear weapons programme and that there should be no apprehensions on this count. This was interpreted by the

former defense minister, Mr K.C. Pant, to mean that we should reconcile ourselves to the reality that Pakistan now has nuclear weapons and that we are prepared to face all eventualities. It was also interpreted as a warning to Pakistan that such a misadventure will fail and be disastrous for that country.

It has been clear for some time now that Pakistan is a covert nuclear weapon state. Pakistan reportedly possesses five to 10 Hiroshima-type bombs. It also has air delivery capability and is developing its own missiles. An Islamabad report dated 5 February 1989 confirmed that Pakistan had test-fired surface-to-surface (SS) missiles and Gen Aslam Beg, chief of Pakistan's Army, said that two SS missiles with ranges of 80 to 300 km respectively had been test-fired recently.

Koranic Injunction

Gen Beg referred to the totality of war and the deterrence provided by the nuclear option and missiles. He has also reiterated the Koranic injunction that preparations for war should be in order to strike terror into the hearts of the enemies, known or hidden, while guarding ourselves from being terror stricken by the enemy.

It has been authoritatively stated that the control of nuclear weapons in Pakistan does not rest with the prime minister. The military establishment exercises this control. These factors are naturally of concern to India.

After the 1974 Pokhran nuclear explosion, India's technical ability to make nuclear weapons was established. India could reportedly deploy 40 to 60 weapons and also has air delivery capability and is far more advanced in the ballistics field. Its integrated guided missile programme was launched in 1983. An SS with a range of 250 km and a payload of one tonne, Prithvi was successfully launched in February 1988. A second test launch was carried out on 27 September 1989. Agni, with a range matching an IRBM [Intermediate-Range Ballistic Missile], was launched on 22 May 1989.

On 25 April 1988, Mr K.C. Pant, then defence minister, stated that there was no vulnerable window in India's defence preparedness and that its forces would not be at a disadvantage in the face of a Pakistani nuclear attack. Subsequently Dr Raja Ramanna, former minister of state for defence, stated that if India was attacked with nuclear weapons it was in a position to retaliate.

In fact, nuclear deterrence already exists in the sub-continent. There is no particular advantage for Pakistan in going overt and it not likely to do so. There is no question of a nuclear exchange between India and Pakistan. Nuclear weapons are not weapons of war, they are weapons of coercion and blackmail. In the nuclear symmetry that exists, the question of coercion or blackmail does not arise.

Contingency Plans

There have been no indications of nuclear militarisation in Pakistan, no organisational changes in army formations for conventional operations in a nuclear environment, and no training exercise in this environment. India does not appear to have taken these steps either. Concepts, command and control, contingency plans for retaliation and other aspects of software can be worked out and familiarity with these ensured without going overt.

India's policy to what is being rightly called the post-proliferation state should keep in mind the advantages of the covert status which gives it deterrence on the cheap. India should not take the initiative in going overt. There is nothing to be gained militarily and the status argument is overplayed.

The Pakistan factor is only one consideration in evolving India's military policy and in deciding its nuclear weapon posture. However, this factor has been a predominant one. At present, Pakistan is deeply involved in the insurgency in Punjab and Kashmir and is likely to persist in this low-cost, low-intensity conflict until we can solve these issues internally.

Indo-Pak Ties

Nevertheless, the Indian Prime Minister has achieved a superficial rapprochement with his counterpart in Pakistan which should be built upon. India's stand at the foreign secretary-level meeting at Islamabad in the third week of December 1990 has been a step in this direction. It is willing to move ahead in other directions even while Pakistan's support in Punjab and Kashmir continues. For India to go overt would be baiting Pakistan. Chances of improving relations in any direction will be doomed. In this connection, the effect of strained Indo-Pak relations on the stability and economy of both countries is obvious.

One important step at the Indo-Pak meeting referred to above is the exchange of instruments of ratifications of the agreement prohibiting attacks on each other's nuclear installations. The next logical step is to sign an agreement banning the use or threat of use of nuclear weapons against each other.

Comprehensive Test Ban Treaty Supported

91WD0498A New Delhi PATRIOT in English
13 Jan 91 p 2

[Text] United Nations, 12 January (PTI)—India has called for a comprehensive nuclear test ban treaty, firmly rejecting the doctrine of nuclear deterrence and theory of validity of atomic weapons.

In today's world, it is almost impossible to identify such permanent and potentially crippling hostilities as have for too long sustained the strategy of 'mutually assured destruction' (MAD). Ambassador C.R. Gharekhan told a conference here on Friday.

Nuclear weapon testing is no longer indispensable for ensuring the reliability of credibility of nuclear weapons but is related to the development of new generation atomic weapons, he said.

Mr Gharekhan said Partial Test Ban Treaty (PTBT), signed in 1963, did result in a sharp drop in radioactive contamination of the atmosphere, oceans and land. But he regretted that it did not culminate in the arrest of the nuclear arms race quantitatively or qualitatively.

The conference at the United Nations headquarters has been called to discuss amendment to make it comprehensive to outlaw all tests.

Recalling that as early as in 1954 Prime Minister Jawaharlal Nehru had called for a ban on nuclear testing, Gharekhan regretted that the 'farseeing' call was ignored and the world lost an early opportunity to contain the growth of nuclear stockpiles.

"The peril to humankind has grown manifold since then as stockpiles have grown and become more sophisticated," he added.

Stating that nuclear weapon states hold the key to success in achieving a comprehensive test ban treaty, Gharekhan said such an agreement required the active participation of all the nuclear weapons states and 'to be truly effective 'it must be 'universally observed.' [quotations as received]

Official on Plutonium Oriented Nuclear Research

BK1102091991 *Delhi Domestic Service in English*
0830 GMT 11 Feb 91

[Text] Indian scientists believe that generating nuclear power using plutonium technology will help to face the energy crisis in the country. In a symposium in Bombay, the Atomic Energy Commission chairman, Dr. P.K. Iyengar, said that all types of nuclear fuel containing plutonium have been investigated in India. Plutonium technology attains vital importance for India as uranium resources within the country are very limited.

Indigenous Nuclear Reactor Design in Final Stage

BK2002085691 *Delhi Domestic Service in English*
0730 GMT 20 Feb 91

[Text] The Bhabha Atomic Research Center—BARC—in Bombay is in the final stages of designing an atomic reactor based on a totally indigenous concept. Named as advanced heavy water reactor, it will be cheaper to build and operate. This has been stated by the chairman of BARC, Dr. P.K. Iyengar, in an article published in CURRENT SCIENCE. The new reactor will use thorium, which is abundantly available in the country, as fuel and ordinary light water as coolant.

Gang Held for Selling Suspected Uranium

91WD0495A *Madras THE HINDU in English* 3 Feb 91
p 1

[Text] New Delhi, 2 February—The Delhi Police Crime Branch seized a packet of good colour granules being passed off as uranium and offered at a price of Rs 1.75 crore by a group of businessmen in Delhi. The police are trying to confirm if the material is indeed uranium.

The five persons taken into custody have been identified as Ajay Sharma, Rajinder Kumar, Sanjay Seth, Bhagwan and Sunil Kaushik.

The gang which allegedly obtained 800 gm of the golden colour granules packed in a plastic pouch from Manoj Kumar of Gaya, was reportedly looking for an appropriate customer. The businessmen had bought the packet for Rs 1.60 lakh, police said.

IRAN

German Company To Build Two Nuclear Plants

LD0403230391 *Tehran IRNA in English* 1625 GMT
4 Mar 91

[Text] Bonn, March 4, IRNA—The German Company Kraft Werk Union which is committed to build two nuclear plants for Iran in the Persian Gulf port-city of Bushehr has asked Iran's views for the appropriate technology.

A spokesman for Kraft Werk Union said today that the company does not know if Iran wishes to have new technology for the two plants or the older one according to a contract signed way back in 1976.

The spokesman Wolfgang Breyer told IRNA that his company awaits the authorization of the German Government for sending parts and components to the Islamic Republic.

Iran's Atomic Energy Organization entered into an agreement with Kraft Werk Union in 1976 whereby the German company was commissioned to build two atomic plants in Iran with the capacity of 1,300 mega watts. Kraft Werk Union is a subsidiary of Siemens company.

The project was shelved during the Islamic revolution in 1979 with the German company unilaterally cancelling the contract by claiming that the Iranian Government had not paid the outstanding installments and that parts and components at the Iranian customs office had not been released in due time.

In the wake of the unilateral cancellation the two sides filed a claim and a counterclaim with the Paris International Chamber of Commerce. The chamber ruled that Iran should remit the amounts payable to the Kraft Werk Union and the German company should proceed with

the work according to its commitments, which ruling was accepted by both parties to the litigation.

Breyer said in the wake of the issue of the ruling 28,000 tons of parts and components needed for the two plants were sent to Iran, but that the sending of the remaining 7,000 tons would require an official authorization of the German Government. The spokesman noted that thus far on various grounds including the eight year Iraqi war against Iran, the German Government has refused to issue a clearance for the items to be shipped to Iran.

Last month Iranian Foreign Minister 'Ali Akbar Velayati in Bonn asked German officials to issue a clearance for the shipping of the subject items to Iran.

Breyer said initially the cost of the project was estimated to be about 5.5 billion marks, but a revaluation of estimated costs has not yet been made.

He said the Kraft Werk Union would have to inspect the unfinished plant once again, since shortly after their previous inspection of the plant the Iraqi airforce bombed it and inflicted yet undetermined damage on it.

Kraft Werk Union of Siemens company is the largest industrial enterprise in Germany and manufactures various kinds of water, gas, steam and nuclear-operated power plants.

ISRAEL

Netherlands Patriots Deployed Near Jerusalem

LD2502115891 Hilversum International Service
in English 1130 GMT 25 Feb 91

[Text] A battery of Dutch Patriot antimissile missiles has arrived in Israel. Military spokesmen say they have been deployed in the vicinity of Jerusalem and will be used to defend against Iraqi Scud missile attacks. The Patriots are accompanied by 40 Dutch technicians who will assist the Israelis in case the projectiles have to be put into use.

The Dutch Government had offered the Patriots to Israel a few weeks ago, but the Israeli authorities waited some time before accepting the aid.

Netherlands To Fund Missiles

TA2502174591 Jerusalem Domestic Service in Hebrew
1700 GMT 25 Feb 91

[Text] The Netherlands has agreed to fund the Patriot missiles that are to be launched from the battery it sent to Israel yesterday, our army affairs correspondent Karmela Menashe has learned. At first it was reported that Israel would pay the Netherlands about \$500,000 for each missile used. The battery lent by the Netherlands has eight launchers, and has been deployed in the Jerusalem area.

[Jerusalem Domestic Service in Hebrew at 1705 GMT on 25 February adds that "throughout its service in

Israel, the Patriot battery will be operated by Netherlands' officers and men. Israeli Air Force personnel will be permanently based at the site to coordinate control and firing procedures."]

Shamir Urges Elimination of Missiles, Other Arms

TA2802154291 Jerusalem Domestic Service in Hebrew
1200 GMT 28 Feb 91

[Text] The prime minister has said that Israel has a great interest in the results of the war and the developments that will follow it in the Middle East. In the immediate term, the cease-fire must clearly include the missile attacks, and the cease-fire arrangements must include the elimination of all missile launchers and the nonconventional weapons arsenals in Iraq.

Our political correspondent Arye Golan reports that the Prime Minister's Office this morning issued an announcement about Shamir's remarks, in which he expressed the hope that the elimination of tyranny in Iraq would be followed by the willingness of Arab countries to reach peace with Israel.

The prime minister congratulated the allies, headed by the United States and President Bush, on the victory in the war against Iraq. He added that even on this happy day we remember the victims of war in Israel, and we send our condolences to their families, as well as wishes for a speedy recovery to the wounded. The government will do all that it can to see that those who were evacuated from their homes will have them reconstructed soon.

Binyamin Netanyahu on Nuclear, Chemical Weapons

TA1302120091 Jerusalem Voice of Israel and IDI
Radio Network in Hebrew 1105 GMT 13 Feb 91

[Telephone interview with Deputy Foreign Minister Binyamin Netanyahu by political correspondent Jack Katzenell - live]

[Text] Not only Iraq but also Libya is busy developing nuclear and chemical weapons. This was the item on the Knesset's agenda today. Our correspondent Ze'ev Kohen reports from the plenary hall:

The Gulf war and the fear of chemical weapons from Iraq served as the excuse for Knesset Members 'Amir Peretz and Sha'ul 'Amor to raise the issue of the development of nuclear and chemical weapons in Libya. Deputy Foreign Minister Binyamin Netanyahu, who responded, said that the production in al-Rabitah near Tripoli was discontinued thanks to Israeli pressure. There are four Middle East countries who are developing chemical weapons, and the world must take action to impose an embargo against them.

[Begin Netanyahu recording] The handful of industrialized countries, which are the only ones to possess the

technology required by these tyrannical countries, must get together and join in a separate and discrete policy. As to whether the United Nations adopts that policy or not is a different and less important issue. What these countries must do is adopt a policy advocating a complete embargo on the transfer of that lethal technology to tyrannical regimes, particularly those in the Middle East. [end recording]

The Middle East, said Binyamin Netanyahu, also teems with conventional weapons. Israel and the world must take action to make progress toward peace and to limit the proliferation of conventional and nonconventional arms alike.

Army Sources Comment on Syrian Missile Purchases

TA0703091691 Jerusalem Domestic Service in Hebrew
0900 GMT 7 Mar 91

[Text] Reacting to reports about the arrival of upgraded North Korean missiles in Syria, military sources said that the Syrians are trying to obtain a missile that will have greater precision than the Scud in the 500-km range, as well as a mobile launcher, in order to be able to launch missiles from deep within Syrian territory or, alternatively, to hit southern Israel.

Our army affairs correspondent Karmela Menashe reports that in the past, the Syrians tried to obtain SS-23 missiles from the Soviet Union and, having failed, turned to East Asia.

PAKISTAN

France Seen Refusing To Supply Nuclear Plant

BK2402012091 Hong Kong AFP in English 1608 GMT
22 Feb 91

[Text] Islamabad, Feb 22 (AFP)—France has refused to supply Pakistan with a 900-megawatt nuclear plant promised to Islamabad a year ago, Pakistani newspapers said. China, which pledged in November 1989 to build a 300-megawatt nuclear plant, is now hesitating because of funding problems, two English-language newspapers added.

According to THE NATION, Washington pressured France to go back on its commitment to supply Pakistan a plant worth an estimated 10 billion francs (two billion dollars). Washington, which is concerned that Islamabad is trying to build nuclear weapons, is trying to convince other European countries not to transfer technology to Pakistan, THE NATION said.

Another newspaper, THE NEWS, said that financial difficulties with France had arisen, as Pakistan faces a grave economic crisis since Iraq's August 2 invasion of Kuwait. France has not officially informed Pakistan of its decision and was expected to "prolong the financial

negotiations as far as possible" without cancelling the deal outright, THE NATION said.

At the conclusion of his visit to Pakistan on February 21 last year, President Francois Mitterrand said, "France pledges to authorise French industrial enterprises ... to make rapidly a technical and commercial offer for the sale of a nuclear power plant to Pakistan." Mr. Mitterrand said at the time that he trusted Pakistan—12 years after a bilateral crisis provoked by France's cancellation of a contract to build a plant to reprocess nuclear fuels.

PAEC Chairman Khan Defends Nuclear Policy

BK2102143991 Islamabad THE PAKISTAN TIMES
in English 21 Feb 91 p 10

[Text] Lahore, Feb. 20—The Chairman of Pakistan Atomic Energy Commission [PAEC], Mr. Munir Ahmed Khan, has said that Pakistan was in favour of maintaining a nuclear free zone in south Asia but would not sign a Non-Proliferation Treaty as long as India did not sign it.

Delivering a lecture on "Pakistan's nuclear programme" arranged by the Pakistan Institute of National Affairs and presided over by Punjab governor here today, the PAEC Chairman said that any non-proliferation policy against Pakistan would not be accepted. He said that Pakistan would not compromise on its nuclear programme for the sake of foreign aid.

Referring to suspension of US aid to Pakistan, Mr. Munir Ahmed Khan said President Bush had certified in October 1989 that Pakistan was acquiring nuclear capability for peaceful purposes only. He said that he was surprised over non-certification by the US President on the issue in 1990 in spite of the fact that no changes had taken place in our peaceful nuclear programme.

He said that USA and various European countries had been creating obstacles in our nuclear programme. Dr. Henry Kissinger, he said, had in 1976 urged the then Government in Pakistan to refrain from acquiring nuclear capability.

Giving an assessment of Pakistan's current nuclear status, he said that the country had the largest research and development facilities in the nuclear field in the entire Muslim world and happened to be the second largest in the whole Third World. Recalling the background of Pakistan's nuclear programme, Mr. Munir Ahmed said that a comprehensive plan was approved in 1972 which is being pursued ever since. He said India's nuclear explosion in 1974 caused a great set-back for the peaceful application of nuclear energy throughout the world.

He said Pakistan was made a target of discriminatory attitude and a number of treaties and contracts with Pakistan even under international safeguards were cancelled.

Mr. Munir Ahmed Khan cautioned that while dealing with the nuclear issue utmost restraint and care should be exercised so as not to provide ammunition to our critics abroad to attack and undermine our nuclear programme.

Presiding over the function, Punjab Governor Mian Muhammad Azhar said our scientists and engineers were working hard to give the country a bright future despite many constraints. The Governor hoped that our nuclear programme would also help us safeguard our frontiers.

Commentary Critical of West's Nuclear Policy

BK1802115791 Islamabad *THE MUSLIM* in English
18 Feb 91 p 4

[Article by Brigadier (Retired) S.A.I. Tirmazi entitled: "Sabotaging Pakistan's Nuclear Energy"]

[Text] Notwithstanding the fact that nuclear power plants are quite different to nuclear weapons and the manufacture of nuclear bombs from reactor grade plutonium is almost impossible, developed countries have shown little understanding of Third World energy requirements and linked the transfer of technology to nuclear proliferation restrictions. International Nuclear Fuel Cycle Evaluation (INFCE) in their final communique stated, "Nuclear energy is expected to increase its role in meeting the world's energy needs and can, and should be widely available to that end; that effective measures can, and should be taken to meet the specific needs of developing countries in the peaceful use of nuclear energy and that effective means can, and should be taken to minimise the danger of proliferation of nuclear weapons without jeopardising energy supplies or the development of nuclear energy for peaceful purposes. Why Pakistan's quest for harnessing nuclear energy has suffered serious set-backs can only be explained by those who are at the helm of affairs.

In the mid-50s, USA launched "atoms for peace programme" for sharing the benefits of peaceful use of nuclear energy and Mr Munir Ahmed Khan the PAEC [Pakistan Atomic Energy Commission] Chairman, went to North Carolina State College, Raleigh, USA, for training. After completing the training he decided not to come back to Pakistan till December 1971, when ZAB [Zulfiqar Ali Bhutto], brought him back to Pakistan and made him chairman, PAEC.

Scientists connected with KANUPP [Karachi Nuclear Power Plant] are of the view that Dr Usmani his predecessor, had almost completed the project by starting it in 1966. The civil works were completed in 1969 and trial electricity generation started during 1971 though formally the plant was inaugurated in Dec. 1972 with Mr Munir as Chairman PAEC.

Uptil now PAEC has neither formulated any nuclear energy policy nor Nuclear Power Plant policy. Pakistan had first 5MWe. Pakistan Research Reactor (PARR) in 1965 and since then no progress had been made till 1989

when 28MWe 'Toy Reactor' was purchased from China. It is not understood why CANDU [natural uranium-based reactor] type NPP [Nuclear Power Plant] was not duplicated? When our scientists have the ability and technical know-how! Is it sabotage or inefficiency or deliberate negligence? It may be mentioned that KANUPP is a 125 MWe power plant but due to its age and safety factor only 95 MWe electricity is being generated. It is creditable that in spite of the Canadian embargo on the fuel—heavy water and spares—since 1974, Pakistani engineers are running it efficiently and safely. They have developed indigenous capability to manufacture maintenance, spares and fuel fabrication. If directed and led, they could have easily duplicated it.

Even Technical Advisory Council which is headed by the Prime Minister and meets once a year to review the policy had also recommended duplication but still not implemented for reasons best known to PAEC authorities. In 1974 PAKNUR [Pakistan Nuclear Reactor] Canada was proposed but shot down by PAEC Chairman. In 1976, approval was given for a 600 MWe power plant at Chashma which again fell through due to domestic politics and faulty planning.

Mr. ZAB had gone on a tangent as on Jan 2, 1972 he declared in the Multan conference that Pakistan will have an atom bomb within two years. Who could have put such an idea in the head of a prime minister should not be too difficult, to guess some effort also said to have been made to pursue the plutonium route, obviously, without any success. It may be mentioned that plutonium 240, 242 is considered 'ugly'. It is 'ugly' to fabricate and 'ugly' to use as it has high fission rate setting dangerous chain reaction. Any activity or planning to get plutonium by nuclear fuel cycle will be a waste of time and effort.

Who pulled the bluff by trying to obtain a Nuclear Reprocessing Plant [NRP] is still a mystery and haunting Pakistan's nuclear energy efforts? A country has to have a large amount of spent uranium to reprocess it. Our scientists give zero value to the spent fuel of KANUPP. It is just kept there. Still 'somebody' wanted to purchase a NRP. Why? Who?

In other policy parameters of PAEC, extraordinary and wasteful efforts have been directed towards mining and exploration of uranium. Incidentally, uranium happens to be dirt cheap and available off-the-shelf in the world. Due to lack of job satisfaction, and faulty policies of PAEC a number of brilliant scientists have reportedly left Pakistan to seek employment in foreign countries; a dangerous brain drain which must be checked.

As for the development of nuclear deterrent, chairman PAEC Mr. Munir Ahmad Khan had following to say, "Nuclear proliferation is basically a political problem. The reasons for the proliferation of weapons, including nuclear, are linked with perceptions of security needs and national interests. The acquisition of nuclear weapons by a developing country would not enhance

their security. Instead, it would expose them to threats of a direct nuclear attack by others, against which they would have no viable defence. And should a developing country decide to acquire nuclear weapons, it would inevitably put an almost unbearable economic burden on that country and cause serious social and political problems which its own borders, where generally a large segment of the population is deprived of even basic necessities of life. [sentence as received] If developing countries want to retain the so-called nuclear option, it is basically a political reason either as a reaction to the discriminatory nature of attitude of NWS [expansion unknown] as formalized in NPT [Nuclear Nonproliferation Treaty]" (THE NATION—18 September 87).

PAEC will be well advised to follow a dual policy: importation and parallel development of indigenous technology. Now that Pakistan is importing 300 MWe NPP from China and 900 MWe NPP from France which are likely to be operative by 1996-97, PAEC must pursue plans for the indigenous development of 600 or 300 MWe NPP and nuclear Reactor Technology in collaboration with other Nuclear powers and Third World countries as if one country can do it independently or can be self-sufficient in all components of nuclear power technology. The national goals and aspirations can only be achieved if PAEC is headed by a sincere, committed, honest, competent and a dynamic Chairman.

KGB Review Need for Nuclear Power Plant Security

91WN0217B Kiev *PRAVDA UKRAINY* in Russian
4 Dec 90 p 2

[Article by V. Nosko and A. Ostapenko, UkSSR KGB employees: "Pickets at the Nuclear Power Plant: Or Fuses Made of Political Passions"]

[Text] The remarks offered to the reader have been written by people who are professionally concerned with ensuring the security of nuclear power plants. Fate so disposed that their authors, A. P. Ostapenko and V. F. Nosko, senior officers with the UkSSR State Security Committee, were at the site of the accident within several hours after the explosion at the Chernobyl Nuclear Power Station. The former was involved in evacuating people from Pripyat, and the latter served on an operational investigative group. Both were subsequently taken out of the zone for medical reasons. Their observations and conclusions have been paid for with their own health. That is all the more reason that we should listen to them.

Today it can already be said that some "specialists" are not opposed to writing the Chernobyl accident off to "the hand of the enemy." It is understandable that in the face of such statements the security agencies were unable to remain on the sidelines. The hard work of KGB officers made it possible to substantiate the conclusion that there had been no sabotage, and thereby to define other areas of search for causes of the reactor's explosion. The amount of what has been done can be judged from the following data alone. Altogether, KGB agencies have received more than 200 statements by citizens concerning the accident's possible causes, and more than 1,500 other documents pertaining to the elimination of its consequences. The government commission and the procuracy have been informed of the results of follow-ups on and the study of these materials. That is just part of the answer to those who ask the question: What is the reason for the presence of chekists at nuclear power plants?

The Chernobyl tragedy demonstrated to the whole world how vulnerable nuclear power plants are in a technical sense. However, it is not just mistakes in designing, unreliable equipment, or inadequately qualified service personnel at nuclear power plants that can result in accidents with grave consequences. Alas, the unique properties of radioactive materials attract people who by no means always have noble intentions and purposes. Lately, unfortunately, the term "nuclear terrorism" has become common in the world political lexicon. Because of the dangerousness of this phenomenon, it has been designated as one of the extremely urgent problems of national and international significance. Literally the whole world has responded with alarm to reports of various sorts of attacks on U.S. nuclear facilities, including attacks aimed at stealing radioactive materials, reports of an armed incident at a nuclear power plant in

South Africa, and reports of attempted sabotage at nuclear power plants in France.

Special trained units have been set up in all foreign countries to combat nuclear terrorism. For example, there is a police administration for nuclear power in Great Britain. It protects nuclear power plants against criminal attempts and unsanctioned penetrations of plant grounds, maintains protection within a 24-kilometer radius, and is also prepared to for combat actions against armed terrorist groups.

In a number of countries legislative acts have been adopted that provide serious sanctions for unlawful actions with regard to nuclear facilities and radioactive materials. Thus, the United States has a law stipulating criminal liability or a fine of \$250,000 for violations of the IAEA [International Atomic Energy Authority] convention, which contains principles for the protection of nuclear power complexes that are uniform for all the organization's member-countries.

The ever-growing rise in crimes accompanied by cruelty and violence, the use of weapons stolen in military units and from the militia in interethnic conflicts, the increasingly frequent cases of the seizure and hijacking of airliners, and a number of other factors compel us to think about potential acts of nuclear terrorism within the USSR, as well. It is no accident that in January 1989 the USSR Council of Ministers instituted special security procedures at all nuclear power plants; oversight over the implementation of these procedures has been entrusted to KGB agencies. And even before that, in March 1988, the Presidium of the USSR Supreme Soviet adopted the ukase: "On Criminal Liability for the Illegal Use of Nuclear Materials." The final touches are being put on the USSR law on the Utilization of Nuclear Energy and Nuclear Security.

As for state security officers, their goal is to prevent acts of sabotage at nuclear power plants, and to oversee the reliability of the system for operating and protecting those facilities. Such measures are carried out in close cooperation with the management of nuclear power plants, as well as with agencies and troops of the Ministry of Internal Affairs, in full accordance with the IAEA's recommendations and other international requirements.

And today we cannot fail to share the concern of the personnel of existing nuclear power plants, the builders, and the military personnel of the USSR Ministry of Internal Affairs' special forces that are guarding the Khmel'nitskiy and Rovno nuclear power stations in connection with the picketing of those facilities by various public political organizations. Their most active representatives have even made attempts to penetrate into the protected zones, block the work of the nuclear power plants' operating personnel, and carried out other unlawful acts. Thus, the executives of the Khmel'nitskiy and former Crimea nuclear power stations have received

anonymous letters threatening them with physical violence if the construction and operation of generating units continues. It goes without saying that this sort of "social activeness" by no means contributes to the safe operation of nuclear complexes. Confrontation and an atmosphere of mistrust surrounding our nuclear power plants can have extremely grievous consequences.

Of course, one can also understand the public and the people living in proximity to nuclear power plants, who react with distress to every instance of fire, the development of other emergency situations, and unplanned stoppages of equipment. That is a manifestation of the "post-Chernobyl syndrome." But it can also be cured by providing people with accurate and truthful information. That is possible today since the country is developing a new approach to the understanding of state secrets and departmental secrets, the list of which has been considerably shortened. In nuclear power engineering nearly all information has become open. And now it is all the more inappropriate to ignite fuses made of political passions at such dangerous facilities as nuclear power plants.

Soviet To Lead Chemical Weapons Committee

*LD1402194191 Moscow TASS in English 1841 GMT
14 Feb 91*

[By TASS correspondent Vitaliy Makarchev]

[Text] Geneva February 14 TASS—Head of the Soviet delegation at the Geneva disarmament conference Sergey Batsanov was today elected chairman of the special chemical weapons committee, a prestigious body of the conference. He replaced a Swedish diplomat at this post.

In an interview with TASS, Batsanov noted that he sees his task as committee chairman to achieve a qualitative breakthrough in drafting a convention on the complete prohibition of chemical weapons, eliminating their stockpiles and completing the talks by the end of the present or, in any case, early next year.

"A qualitative breakthrough means the achievement of true security of states," Batsanov noted. This call for, above all, the complete destruction of chemical weapons, the full prohibition of chemical arms use and inspection by request.

Batsanov also singled out assistance in protecting future convention signatories, who have no chemical arms, against these mass destruction weapons. "I want to make active efforts in these areas," he noted.

Regrettably, the Gulf war "somewhat decelerates" the activities of delegations, Batsanov noted. At the same time all recognise that developments in the Gulf and the growing threat of the use of chemical weapons prompt the need to agree and conclude the convention as soon as possible.

"It seems to me that top-level efforts to ban chemical weapons worldwide should blend well with the new security structures which will emerge after the end of the war," Batsanov stressed.

Nuclear Nonproliferation Reportedly in Jeopardy

*LD1402131791 Moscow TASS in English 1255 GMT
14 Feb 91*

[By TASS military writer Vladimir Bogachev]

[Text] Moscow February 14 TASS—The nuclear non-proliferation treaty, which has survived the the Cold War between the United States and the Soviet Union is now jeopardised by developments in the Gulf and by a possible revision of Washington's stance on non-use of nuclear weapons against nuclear-free states.

The Soviet Union's commitment not to use nuclear weapons against the countries that do not produce the weapons, acquire them or permit their being stationed on their territories has been one of the most important factors preventing the spread of the "nuclear club".

The United States made a similar pledge. It declared that it would not use nuclear weapons against non-nuclear countries and parties to the nonproliferation treaty. Washington made an exception for countries that attack the U.S. or its allies jointly with a nuclear power.

The Soviet Union's pledge remains in force. However, the U.S. is considering using nuclear weapons against Iraq, according to U.S. legislators and news analyst.

In a TV interview on February 2, U.S. Defence Secretary Richard Cheney, when asked about the possibility of using nuclear weapons against Iraq, said the president of the United States will decide how the country will react to various events, and this is not to be debated.

Speaking on February 1 in London, U.S. Vice-President Dan Quayle said that the use of nuclear weapons remains an option.

The REUTER writes that the Bush administration is leaving a door open to the use of nuclear weapons in order to warn President Saddam Husayn of the possible consequences if he uses chemical weapons against the multinational forces.

Iraq is a party to the nuclear nonproliferation treaty and did not form an alliance with any nuclear power when attacking Kuwait. As such, the exception stipulated in the U.S. statement does not apply to Iraq. Thus the use of nuclear weapons against Iraq would go against the 13-year-old U.S. pledge.

Even the hint at a change in the U.S. stance regarding the use of nuclear weapons against parties to the nonproliferation treaty could undermine the mainstays of the treaty signed by 142 countries. By not ruling out the possibility of nuclear strikes against Iraq, Washington enables Israel, for instance, to justify the possibility of

nuclear war against Arab countries. In these conditions Arab countries may regard their further participation in the nonproliferation treaty to be incompatible with security interests. The "nuclear club" may expand to include several dozen countries. The menace of nuclear catastrophe will increase immeasurably.

Quite possibly, Washington just wanted to intimidate its adversary in the Gulf and discourage it from using chemical weapons against allied forces. But these reckless ill-considered statements about this extremely important and sensitive matter could lead to very dangerous military and political consequences throughout the world.

REGIONAL AFFAIRS

Iraqi Procurement Network Described

91WP0068A Vienna PROFIL in German 4 Feb 91 p 52

[Article by Alan George: "A Respectable Business"]

[Text] "We have never tried to hide the fact that we are doing business with Iraq," says William Pellew-Harvey. Nevertheless, the British national sitting in the office of his lawyer in the elegant St. James section of London, is the subject of intensive inquiries by the American and other Western intelligence services. For two years, up to the invasion of Kuwait and the subsequent UN sanctions, he was the middleman in a series of transactions in which Italian and other European firms made deliveries to Saddam Husayn's arms factories.

Pellew-Harvey admits that his firm had engaged in direct competition with some of the since unmasked Iraqi front firms, such as Italy's Euromac, whose English sister firm tried last year to deliver nuclear bomb triggers to Iraq. In January Qasim 'Abbas, the Iraqi boss of Euromac, was deported to Italy.

British national Pellew-Harvey is the owner of Bonaventure Europe (BE), a firm registered in the Caicos Islands, a British territory in the Caribbean. He operates his business out of a Geneva office; his domicile is Monaco. Geneva is the site of the office of Bonaventure Services (BS), which, according to Pellew-Harvey, is merely a management organization, "not involved in our trade and banking activities."

Since his first visit to Iraq in May 1988, shortly before the armistice with Iran, Pellew-Harvey has signed contracts worth about 110 million schillings in Baghdad. His principal customers were the state-owned enterprises Hutayn and Qadisiyah, the country's most important artillery ammunition and firearms manufacturers.

While Pellew-Harvey basically admits the existence of these trade connections, he is quite reticent about their details. PROFIL's inquiries showed that his deals included Italian, Swiss, German, French, and British manufacturers; the product was intended for Saddam's missile development program.

In Italy some of the Bonaventure contracts were processed by the small business firm, Italian Technology and Innovations (ITI), located in Villa Carcina near Brescia. Its offices were used by independent businessman Paolo Maraviglia, who ordered, among other things, Benelli mechanical presses, valued at 2 million schillings, for Qadisiyah. Two Torino firms, Dea and Sapri, delivered measuring instruments and welding equipment to Geneva, fully aware of the fact that their final destination was Iraq. A Sapri spokesman declared that they "pretty much knew that up to 98 percent of what the Iraqi government wanted went to arms manufacturers."

Maraviglia also served as middleman for a \$1.5 million contract between Milan's MMBI and Bonaventure for supplying the equipment for five machine tool centers. "The precise destination was never revealed," says a company spokesman. It became known only when MMBI's parent company, Maho, located in Pfronten, Bavaria, organized the deployment of technicians to install the machinery.

Another German Bonaventure partner, Tiefbohrtechnik [deep drilling technology] of Dettingen, delivered drilling machines to Geneva in 1989. Bonaventure had purchased machinery from the Baltec Company of Pfäfers near Zurich as early as 1988. At that time the real customer, Qadisiyah, became known only when a technician was sent there. When he found out that it was an arms manufacturer, he returned home without finishing his assignment.

In addition to metal processing machinery, Bonaventure also procured for Iraq testing instrumentation suitable for use in developing ballistic missiles. Pellew-Harvey strongly denies having visited Iraq's Sa'ad-16-Complex near Mossul, where Iraqi missile development took place prior to U.S. bombing attacks. "I know the place only from newspaper stories," he says.

Early last year Bonaventure purchased from the Paris firm, Acutronic, a centrifuge, with a diameter of 120 cm, which was installed at Baghdad University. Acutronic describes its use as "testing of electric components." Pellew-Harvey says that it can be used also to test ammunition fuzes. He had unsuccessfully attempted to purchase inertial guidance systems, as used in missiles, from Acutronic's Swiss subsidiary.

During his interview Pellew-Harvey indicated that his biggest deal with Iraq—which was canceled by the UN sanctions—involved two industrial X-ray installations for the Hutayn ammunition plant. One, worth 11 million schillings, was to come from the Varian Company in California; another, worth 2.2 million schillings, from Philips in Germany. Both firms deny having intended to make delivery; however, people at the Philips plant in Hamburg remember British systems consultant Mike Davis, who had connections with both Iraq and Bonaventure. Pellew-Harvey refers to Davis as a "close personal friend." Davis says merely that he has heard people talk about Pellew-Harvey. He confirms having been in Iraq in 1989 to demonstrate X-ray systems, but claims that his business connections with Bonaventure never went beyond the proposal stage.

Pellew-Harvey is amazed at the great interest in his activities. Swiss officials apparently visited his Geneva office at the request of the French police. "The French had arrested someone who was in possession of one of my old business cards," says Pellew-Harvey. The Swiss had left his office in short order. According to Pellew-Harvey, there was no reason for Swiss and other countries' authorities to be concerned about Bonaventure. "We operate respectable business."

BELGIUM**Belgian, Jordanians Bribed in Supergun Scam***AU1802182591 Paris AFP in English 1814 GMT
18 Feb 91*

[Text] Brussels, Feb 18 (AFP) — Several Jordanian ministers and a senior Belgian Defense Ministry official received bribes in return for illegally exporting a special powder for use in the Iraqi project to build a long-range "supergun," according to a British engineer, in interviews published on Monday [18 February].

Speaking to the Belgian daily HET VOLK, engineer Christopher Cowley said that a Belgian official had received 25,000 dollars for each shipment of a special powder produced by Poudreries Reunies de Belgique (PRB) which he allowed to be exported in violation of Belgian law.

An official Belgian spokesman refused to confirm or deny the allegations.

Belgian Foreign Trade Minister Robert Urbain recently said that Belgium had authorized the delivery of 235 tons of explosives to Jordan in December 1988.

He indicated that only 25 tons were delivered by Belgian military aircraft.

Although Belgian law forbids delivery of armaments to conflict zones, this powder was reportedly delivered to Baghdad, then at war with Iran.

Mr. Cowley, speaking to the Belgian weekly LE VIF-L'EXPRESS, said that 25,000 dollars in gold ingots had been delivered to certain Jordanian ministers "to insure the good will of the Jordanian Government."

He said that at least one supergun was operational in Iraq.

BBC Television was to show satellite images on Monday of the Jabal-Makhal mountain in central Iraq, reportedly the site of an Iraqi supergun with a range of 480 kilometers (300 miles) aimed at Israel.

Gerald Bull, the creator of the supergun, was killed on March 22 in Brussels by unidentified assassins.

The BBC has reported that the killers were members of the Israeli secret services.

Country's Role in Iraqi Supergun Described*91AN0249B Ghent HET VOLK in Dutch 19 Feb 91 p 2*

[Report: "Supergun Manager on Illegal Arms Traffic With Iraq: 'The Whole of Europe Is Guilty'"]

[Excerpts] Brussels/Bristol—"The Western world has joint responsibility in illegal arms traffic with Iraq. During the 1980's, there was a general political trend to provide military support to Saddam Husayn in his war

against Iran, in spite of an ongoing embargo. Belgium was not any different. Moreover, the Belgian Government cannot say it was not aware of this." This statement was made by Chris Cowley, project manager of the Babylon project, better known as the famous supergun for Iraq. Cowley worked closely with the Canadian genius, Gerald Bull, who was murdered by the Israeli secret service, Mosad, in Uccle in March 1990. [passage omitted]

Belgium's Role

Regarding the Belgian role in the Babylon project, Cowley is clear: "PRB supplied the specific propellant for the supergun, i.e., gun powder of 12 mm diameter. Because a regular carrier aircraft was considered too dangerous, PRB decided to transport the goods to Amman (Jordan) in a Belgian Air Force Hercules C130. Once it arrived, it was handed over to the Iraqis. Baghdad bribed a senior Belgian official of the Ministry of Defense with \$25,000 per delivery." Cowley refused, however, to mention any names. On 30 January 1991, Minister of Foreign Trade Urbain confirmed in the Chamber of Representatives, that the government approved the export of 235 metric tons of gun powder to Jordan, but that in the end only 25 metric tons were delivered. The first shipment took place in May 1989. We have not been able to get an official reaction from the Ministry of Defense. [passage omitted]

CANADA**Ontario Hydro on Research Halt, Reactor Problems****Advanced Candu Research Halt***91WP0069A Ottawa THE OTTAWA CITIZEN
in English 5 Feb 91 p A10*

[Article by Tom Spears: "Hydro Pulls Plug on \$21M for Nuclear Reactor Research"]

[Text] Ontario Hydro has pulled the plug on research worth \$21 million a year done by Atomic Energy of Canada Ltd to develop a future generation of nuclear reactors.

Hydro will still contribute the same amount—\$157 million—to AECL, but it will be directed only at research that can be applied at existing nuclear stations, in areas such as waste disposal, safety, licensing and computer technology.

The move comes as a result of a nuclear-power moratorium imposed by Ontario government.

A senior Hydro executive says the change in funding means AECL will have to scramble to make up the cash for research into future reactors or risk seeing its Candu technology become less competitive.

"It matters a lot," said Barry Collingwood, manager of the Candu Owners' Group, the committee of provincial utilities with nuclear power.

As other nations continue to improve the technology, Collingwood said "it won't be long before you won't have a competitive product."

AECL Vice-President William Hancox said research on the next generation of reactors will still go ahead despite the loss of Ontario Hydro's contribution.

"It might be a little slower, but we don't see it stalling," he said. AECL will have \$6 million to \$7 million a year left for the Advanced Candu, the generation of reactors to be built after the Darlington station.

Hydro is still contributing the same amount of money to AECL's overall research budget of about \$157 million, Collingwood said. But because of the New Democratic government's three-year nuclear moratorium, Hydro won't donate money for research on the Advanced Candu.

Construction Delay, Efficiency Problems

91WP0069B Ottawa THE OTTAWA CITIZEN
in English 9 Feb 91 p A7

[Article by Tom Spears: "Construction Delays Add \$400M To Cost of Darlington Plant"]

[Text] Construction delays have pushed the cost of building the giant Darlington nuclear power station to \$13.3 billion. The project was originally estimated at \$3.9 billion.

Ontario Hydro's latest revision of the cost of Canada's four biggest reactors is a \$400-million increase from December's estimate of \$12.9 billion.

Hydro blames the increases on construction problems at the two unfinished reactors. Unit 3 was to start up next December, but has been delayed until June 1992. Unit 4 will be delayed three months from its target of December 1992.

The Darlington station, located on the shore of Lake Ontario east of Oshawa, is the latest addition to then nuclear power grid that supplies about half of Ontario's electricity.

Hydro has also announced trouble with its existing reactors. The 16 reactors at Pickering on Lake Ontario and the Bruce station on Lake Huron haven't been running at the 80-per-cent efficiency level Hydro said they would reach as a lifetime average.

Hydro's nuclear stations averaged 62-per-cent efficiency last year because of maintenance and unscheduled repairs, said Hydro spokesman Geoff McCaffrey.

This means the stations produced 62 per cent of the power they would produce if they ran all year at full power. In 1989 they ran at an average 72 per cent of capacity.

Hydro says nuclear plants will average 75 per cent for the next decade. Over a lifetime (estimated at 40 years) the oldest eight plants will average 75 per cent and the newest ones will run at 80 per cent, the utility says.

The efficiency rating is crucial because it is used to determine Hydro's ability to meet electrical demand.

The anti-nuclear lobby group Energy Probe says Hydro's admission of the slack performance of nuclear stations is a milestone in making Hydro's planning process more realistic.

"We've been saying for years it's grossly irresponsible of them to pretend they would achieve 80 per cent," said Energy Probe research Tom Adams. "We're calling it a victory... Hydro is admitting the obvious."

FRANCE

New Computerized Safety Systems Delayed

91WP0063B Paris LE MONDE in French 31 Jan 91
p 16

[Article by J.-F. A. and J.-P. D.: "EDF Faced With New-Generation Power Plant Computer Failures"]

[Text] The EDF [French Electric Power Company] is being compelled to postpone the putting into service of its new computerized nuclear safety systems with which it had intended to equip its new generation of 1,400-megawatt nuclear reactors, like the one at Chooz (Ardennes). A number of technical constraints are delaying the start-up of these new support systems to no sooner than 1995.

These installations were to be the showcase of EDF know-how, the absolute "must" in the realm of nuclear safety. What the others had not yet succeeded in achieving, the EDF was going to provide on its new generation of nuclear reactors, the famous 1,400-megawatt N-4's, of which Chooz B-1 in the Ardennes is the top-seeded performer.

Then, something went awry in the beauteous new mechanism and it was learned that the shiny, all-new plant would not be put into service in 1993 as planned, and more than likely not before 1995. The reason: An excess of ambition. Not that the EDF made the wrong choices but rather that the attainment of the object aimed at demands more time.

Armed with the lessons of the Three Mile Island accident—which fortunately produced no serious consequences—EDF, early on, decided to computerize part of the command and control structure of its installations, so as to avoid the introduction of human errors during the

first moments of a catastrophe—bad diagnosis of the situation, inappropriate remedial measures—that could rapidly lead to a worsening of the situation.

This is why, during the first 20 minutes following, say, the accidental rupture of a large conduit in the cooling system of any French reactor, the reactor is controlled entirely by computer. This allows the plant's management and supervisory personnel to recover their bearings, to better understand the reality of the situation, and consequently to optimize their reaction to it.

Aware of the benefit of these necessary improvements to the safety of its installations, the EDF has installed, in addition to the conventional control room, which directs the operation of the nuclear plants in its power generating complex, a computerized troubleshooting and support system. Only by knowing a plant's impressive array of dials, visual alarms, and different parameter-recording devices can one imagine the nightmare a control room can represent for a management and supervisory team.

P-20 Failures.

It must be recognized that the members of these teams all adapt well to these difficulties, which the EDF is seeking to reduce further by fully computerizing the command and control system of its 1,400-megawatt plants. It was to this end that EDF decided to install four powerful computerized systems in the control room to handle its new nuclear additions.

The first of these systems controls all that concerns the protection and safety of the turbo-alternator. The second, developed by Merlin-Gerin together with Framatome, takes care of protecting the reactor. The third, the P-20, manufactured by Cegelec, gathers all the data pertaining to and generated by the installation, sorts, processes, and finally "passes" them to the fourth computerized system, whose function is to display these data on a screen, for use by the operators, in clear and readable form.

The latter data processing unit, the production of which was initially awarded to Thomson, then to Semagroup and Thomson, encountered some developmental problems between 1985 and 1987, involving both the hardware and the software that had been chosen. This delicate situation was finally resolved, and all seemed to be going well, until problems of the same nature appeared in the development of the P-20.

The problems are such that it is clear at this point that they will not be resolved within a reasonably short time. According to one expert, it will probably take around four or five years to clear them, instead of the initially estimated two years. But would abandonment of the alluring philosophy of a hyper-computerized nuclear safety system for the period necessary to develop it be justified, or should the steps already taken be retraced and more-conventional control rooms analogous to

those of the 1,300-megawatt plants at Cattenom and Paluel be installed for the 1,400-megawatt plants?

The ball is in the EDF's court. Around the beginning of January, the EDF launched a six-months study on the times necessary for implementation of each of these solutions. Concurrently, the SEMA [Applied Mathematics Research Company] was retained to determine whether, based on existing hardware and software sold by the Hartmann and Braun company, it would still be possible to develop a P-20 "stripped of its most vulnerable parts." All in all, the cost will probably run very high, and the EDF has already earmarked some 300 million francs for the development of the P-20 and its installation in the Chooz plant.

1990 Report on Nuclear Plants Safety

91WP0063A Paris LE MONDE in French 31 Jan 91
p 16

[Article by J.-P. D.: "Human Risk Persists in Nuclear Plants"]

[Text] Good, but could do better: This, in short, characterizes the findings of Mr. Pierre Tanguy, inspector general of nuclear safety at EDF, in his annual report on French nuclear plant safety during 1990, released Wednesday 30 January.

The French nuclear electric power sector had a "bad year" in 1989, even though no incident had any consequences for the public or the environment. Happily, 1990 was better. No incident exceeded Level 2 on the scale of seriousness, which consists of six levels, as compared to 1989, which registered one Level 3 incident.

On the other hand, although the number of Level 2 incidents in 1990 dropped from five to four, the number of Level 1 incidents rose considerably, from 77 in 1989 to 91 in 1990. Clearly, they were all minor problems. Mr. Tanguy finds, however that, as in preceding years, the most significant incidents involved human error or negligence with respect to maintenance tasks or during construction.

This was specifically the case of the faults found in all the filtration circuits of the new plants this past summer. "The efforts of management in Paris do not suffice to change, overnight, the behavior of the persons on the job," the safety inspector general finds, "and we have not progressed in this regard as far as we had hoped."

To maintain the pace of improvement, he suggests in his report that "those responsible for operations report every six months to the general manager on the results obtained in this domain."

Despite these dark spots in the picture, the level of safety of French nuclear power plants is "rather good," although an effort must be made to improve it further. Mr. Tanguy finds. The EDF, he adds, must continue its

effort to improve maintenance and supervisory functions, but must also tackle resolutely the development of more reliable "reactors of the future," in cooperation with the other countries engaged in "nuclearizing" their electric power generating systems.

The safety inspector general emphasizes the importance of an international approach to nuclear safety, through organizations such as the Vienna AIEA [International Atomic Energy Agency], or direct cooperative agreements with, for example, the countries of Eastern Europe.

GERMANY

Report on Firms Involved With Iraqi Arms

91GE0150A Bonn DIE WELT in German 11 Feb 91
p 6

[Article by "mik": "Saddam Husayn's German Business Partners: The Confidential Preliminary Report of Investigations on Suspicion of Illegal Arms Exports"]

[Text] German public prosecutors, customs officials, and tax examiners are investigating 44 enterprises on suspicion of illegal arms exports to Iraq. That is the result of a confidential preliminary report, compiled on the orders of the federal government, on the state of the investigations. It is at the disposal of DIE WELT. According to the report, the scrutiny of the investigating authorities has led to the initiation of at least four criminal proceedings. In 30 cases, the officials reached no conclusions on illegal business practices.

The paper is the German response to a list by U.S. Senator Jesse A. Helms. Even two years ago, the conservative politician blustered in the foreign affairs committee of the U.S. Senate: If the Bonn government had read page one of the NEW YORK TIMES of 30 March 1984, it would have known that the German firm, Karl Kolb, was building a poison-gas factory in Iraq. Helms verbatim at that time: "If the German foreign minister did not know that, he needs a blind man's cane. He did not want to know it."

Shortly after the invasion of Kuwait by Saddam Husayn's troops, Helms handed his President, George Bush, a list compiled from publicly accessible sources ("Saddam Husayn's Foreign Legion") of 132 suppliers to Iraq—62 of them from the FRG. Early in January Helms, through diplomatic channels, provided the Bonn government with an updated version.

On the basis of this list and documentation from the Simon Wiesenthal Center ("The Poison Gas Connection"), German security authorities compiled for the federal government the findings on contributions by Germans to the Iraqi armaments program. It turned out to be very difficult to prove violations of existing law against the enterprises listed as business partners of Iraq. Even worse: In at least two cases, the legal position

lagged behind the existing situation. Export regulations were tightened when it became known that some special vehicles, for instance, up to then did not fall under the embargo.

Even in the case of the Karl Kolb connection, matters are proceeding only slowly. The prosecutors' investigation took seven years, and it will take several more weeks until it is decided whether initiation of main proceedings will be applied for.

The borderline between legal and illegal transactions is obviously unclear—the investigators are moving on very difficult ground. They are focusing on three groups: First, it is relatively easy to ascertain participants in large projects, for on the basis of the necessary know-how only a handful of first-class industries come into consideration. Those, however, frequently send medium-sized subsidiaries or companies controlled by subsidiaries into the field, or deliver supplies via foreign partners. Second, also easily ascertained is the small group of unscrupulous specialists who do not flinch from doing business involving biological and chemical weapons. Third and last, the investigators are trying to shed some light on the semidarkness surrounding the group of mercantile agents who arranged Husayn's business deals.

1. No Findings

ABB Asca Brown Boveri AG, Mannheim—Electrical engineering (sales: 6.1 billion German marks [DM]; 34,100 employees). Allegation: Electrical equipment for smelting furnace in gun factory. Status of the case: "Review by Main Finance Administration in Karlsruhe showed only exports of general electrical equipment exempt from licensing. In addition, delivery of smelting furnaces exempt from licensing."

AEG AG, Berlin and Frankfurt/Main—Electrical engineering (sales: DM12.2 billion; 89,600 employees). Majority shareholder is Daimler-Benz (approximately 80 percent), the rest are scattered holdings. Allegation: Production plant for weapons and ammunition. Status of the case: "Customs Criminal Institute has no findings relevant to Iraq. On the basis of SPIEGEL data, correlation to concrete facts of the case not possible. (Probably domestic ancillary supplies to the actual exporter.)"

Avlatest, Neuss—Subsidiary of Rheinmetall. Allegation: Subcontractor for chemical weapons factory SAAD 16. Status of the case: "Domestic ancillary supplies to Gildemeister."

Blohm Maschinenbau GmbH, Hamburg—Production and marketing of grinding machines. The parent company (100 percent) is Koerber AG (engineering; sales: DM1.1 billion; 6,400 employees), Hamburg. Allegation: Computer-directed grinding installation for missile research establishment. Status of the case: "Land Office of Criminal Investigation in Darmstadt found no indications of illegal exports."

CBV Blumhardt Fahrzeuge GmbH & Co. KG, Wuppertal—High-capacity cars, low-weight platforms and dumping wagons, chassis for containers and superstructures (sales: DM45 million; 220 employees). Allegation: special transporters for tanks. Status of the case: "Semi-trailers were exempt from licensing; obligation to obtain a permit is being introduced."

Daimler-Benz AG, Stuttgart-Untertuerkheim—largest German industrial enterprise (sales: DM76.3 billion; 339,000 employees); owners: Deutsche Bank (28.28 percent), Mercedes-Automobil-Holding (25.23 percent), the emirate of Kuwait (14), and 300,000 individual shareholders. In correlation with the blocks of Mercedes-Benz AG, Stuttgart, AEG AG, Berlin and Frankfurt/Main, as well as Deutsche Aerospace AG, Munich, Aerospace (aeronautics and space technology, driving gears, defense technology and medical technology, 63,000 employees) are, among others, the holdings of AEG Luft- und Raumfahrt, Dornier, MTU Motoren-und Turbinen-Union as well as MBB Messerschmitt-Boelkow-Blohm GmbH. Allegation: armored vehicles. Status of the case: "Examination by Main Finance Administration in Stuttgart established only exports exempted from licensing."

Degussa AG, Frankfurt/Main—precious metals (sales: DM14.4 billion; 32,400 employees in the corporation); parent company of Leybold AG, Hanau. Major shareholder (with 37 percent) of Degussa is GfC Gesellschaft fuer Chemiewerte mbH, Duesseldorf (Henkel family, Dresdner Bank, Muenchner Rueckversicherung), 40,000 free shareholders. Allegation: Equipment for chemical weapons factory. Status of the case: "Customs Criminal Institute has no findings relevant to Iraq. Clear correlation to facts and circumstances on the basis of DER SPIEGEL data not possible. (Domestic ancillary deliveries to other exporter?)"

Deutsche BP AG, Hamburg—mineral oil (sales: DM11.9 billion; 5,500 employees). Allegation: "Military equipment." Status of the case: "Customs Criminal Institute has no findings relevant to Iraq."

W.C. Heraeus GmbH, Hanau—production of semifinished and finished goods of nonferrous metal (sales: DM4.6 billion; 9,100 employees). Allegation: tube-shaped furnace for biological weapons. Status of the case: "Domestic delivery of a tube furnace to Labsco."

Infraplan. Allegation: installations for the preparation of chemical production. Status of the case: "The Cologne Customs Investigation Office has no findings."

Iveco Magirus AG, Ulm—medium-sized and heavy trucks (sales: DM2.5 billion; 6,800 employees). Allegation: carrier vehicles for mobile toxicological laboratories. Status of the case: "Exports of eight vehicles with laboratory installations by the Rhein-Bayern firm was carried out with negative certificate."

KWU—division of Siemens AG, Munich, until business year 1986/87 Kraftwerk Union AG, Muehlheim a.d. Ruhr. Allegation: nuclear technologies. Status of the

case: "There supposedly were negotiations with Iraqi authorities between 1978 and 1980. No contract was concluded."

Labsco Laboratory Supply Company GmbH & Co. KG, Friedberg—planning and delivery of laboratories and laboratory equipment, primarily overseas—Near East, Far East, Africa (sales 1988: DM8.7 million; 14 employees). Allegation: various biological equipment. Status of the case: "Examination under foreign trade law (AWP) did not result in indications of unauthorized exports."

Lasco Umformtechnik GmbH, Coburg—machine tools (sales 1988: DM53 million, 250 employees), subsidiary of Langenstein & Schemann GmbH, Coburg. Allegation: forging presses for artillery shells. Status of the case: "Prosecutor's office in Hof terminated investigation, because it concerned universal equipment exempt from licensing."

Leifeld & Co. (Leico), Ahlen/Westphalia—tool and machine factory (1988: 470 employees); sold by Matuschka group to Westfalenbank. Allegation: drive jets for rockets, engineering services. Status of the case: "Main Finance Administration in Muenster did not discover unauthorized exports."

MAN-Roland Druckmaschinen AG, Offenbach—97.81 percent owned by MAN AG, Munich. Allegation: transport equipment. Status of the case: "MAN-Roland produces diecasting machines. Probably mistaken for the Roland antitank missile, which was delivered to Iraq by the MBB joint enterprise, Euromissile."

MAN-Technologie AG, Munich—subsidiary of MAN AG, Munich. Allegation: nuclear technology. Status of the case: "Only domestic ancillary delivery to H + H."

Marposs GmbH, Fellbach/Krefeld—electronic measuring instruments for machine tools (190 employees). Allegation: production plant for weapons and ammunition. Status of the case: "Ancillary delivery to H + H. Customs Criminal Institute and Customs Investigation Office in Duesseldorf noted no violation of foreign-trade law regulations."

Matuschka Gruppe, Munich—financial services (staff of 400), the Leico firm was sold meanwhile, see under Leico. Allegation: Leico. Status of the case: "Mentioned only as owners of Leico."

MBB Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn—development, production, and sale of products of aviation and space technology, defense technology, naval technology, of machine, vehicle and equipment engineering, electrical and electronics technology; for example, helicopters, Tornado jet fighters, Ariane missiles, Airbus, the Hot and Milan antitank systems, the Roland defense system against low-flying aircraft (sales: DM6.3 billion; 37,400 employees); compare Daimler-Benz. Allegation: technology for the FAE (Fuel Air explosive); subcontract for the chemical weapons factory SAAD 16; attack helicopters; participation in

Euromissile, Fontenay-aux-Roses, France; Hot and Roland systems; electronics and test equipment for Condor 2 missiles; laboratory equipment. Status of the case: "FAE-bomb delivery of project studies to AGY was exempt from licensing according to the prosecutors of the Land Court Munich II, since they were not manufacturing records. As to SAAD 16, Condor, electronics, and tests for Condor 2, laboratory equipment—the prosecution of the Land Court Munich II has not initiated formal investigations due to lack of sufficient indications of illegal exports (domestic transactions with Consen subsidiary, PGB). Helicopters—so far, no unauthorized exports were found."

Heinrich Mueller Maschinenfabrik GmbH, Pforzheim—founded in 1906, ordinary capital DM400,000; 80 employees. Allegation: technical improvement of the Scud B missile. Status of the case: "The exports carried out were exempt from licensing. Meanwhile the injection nozzle now requires an export license."

Plato-Kuehn (Josef Kuehn), Neustadt am Ruebenberge. Allegation: toxins. Status of the case: "Delivery of the small quantities of toxins (but not the fungi producing them) was exempt from licensing."

Schirmer-Plate-Siempelkamp, Krefeld. Allegation: production plant for weapons and ammunition. Status of the case: "Reviewed by Main Finance Administration in Duesseldorf: the exports were exempt from licensing."

Schmidt, Kranz & Co. GmbH, Velbert—mining equipment, load suspension devices, pumps, and compressors, suction and dust removal (200 employees). Allegation: computer-assisted device for material testing. Status of the case: "Ancillary delivery to H + H for pressure testing device, which in turn was exempt from licensing."

Siemens AG, Berlin/Munich—third-largest German industrial enterprise (sales 1989: DM61.1 billion, 365,000 employees, 538,000 shareholders), electrical products. Allegation: parent company of Interatom GmbH in Bergisch Gladbach (nuclear technology), computer guidance system for gun factory, echo-free space for missile research. Status of the case: "According to the Customs Criminal Institute, there are no findings relevant to Iraq. On the basis of DER SPIEGEL data they cannot be correlated to a concrete state of affairs. (Probably they were normal domestic ancillary deliveries to other firms, which were exporters.)"

Sigma Chemie, Oberhaching. Allegation: chemical-biological raw materials. Status of the case: "It could never be ascertained whether delivery actually took place. Furthermore, because of the extremely small quantities of toxins (not the fungi producing them!) they would have been exempt from licensing."

TUEV—Technischer Ueberwachungsverein, Saarland. Allegation: material surveys for Saarstahl and Export-Union. Status of the case: "Only prepared material surveys."

WTB Walter-Thosti-Boswau Bau-AG, Augsburg—construction industry (group sales: DM1.6 billion; 7,800 employees). Allegation: construction of four factories for nerve gas. Status of the case: "The Customs Investigation Office investigated in connection with PGB. The construction services were exempt from licensing."

Wegmann & Co. GmbH, Kassel—tank turrets, mobile launcher systems, gun mounts, retooling and improving combat effectiveness, training, logistical support, equipment and construction components (sales 1987: DM874 million; 4,800 employees in group). Allegation: traction engine for rocket ramp. Status of the case: "Main Finance Administration in Frankfurt has not found violations of foreign trade law."

Ed. Zueblin AG, Stuttgart—construction business (sales: DM1.2 billion; 6,800 employees). Allegation: construction of steel mill in gun factory. Status of the case: "The Customs Criminal Institute has no findings relevant to Iraq. But might also be included in the investigations of the Customs Investigation Office in Duesseldorf and the Bochum prosecution with regard to Taji."

2. Ongoing Investigations

Anlagen Bau Contor/Beaujean Consulting Engineers, Stutensee near Karlsruhe. Allegation: purchase of high-capacity propulsions for rockets. Status of the case: "Investigations underway by Karlsruhe prosecutors."

Buderus AG, Wetzlar—foundry (sales: DM2.7 billion; 14,200 employees), major shareholder is Feldmuehle Nobel AG, Duesseldorf (98 percent); also see Dynamit Nobel. Allegation: foundry technology for gun factory. Status of the case: "Included in the investigations of the Customs Investigation Office in Duesseldorf and the Bochum prosecution concerning Taji."

Dango und Dienenthal Maschinenbau GmbH, Siegen—sales: DM40 million. Allegation: equipment to work smelttable materials. Status of the case: "Included in the investigations of the Customs Investigation Office in Duesseldorf and the Bochum prosecution concerning Taji."

Wolfgang Denzel. Allegation: radar, radio and navigation equipment for helicopters. Status of the case: "Prosecutor's office in Stuttgart is investigating."

Dynamit Nobel AG, Troisdorf—explosives (sales: DM1.1 billion; 7,000 employees), a subsidiary of Feldmuehle Nobel AG, Duesseldorf, also see Buderus. Allegation: production plant for weapons and ammunition. Status of the case: "Bonn prosecutors are investigating."

Export-Union Duesseldorf GmbH, Duesseldorf—steel export (sales: DM70 million; 20 employees). Allegation: metal for the manufacture of components for gas centrifugal machines for uranium enrichment. Status of the case: "Customs Investigation Office in Duesseldorf is investigating."

Faun AG, Lauf, headquarters: Nuernberg—commercial vehicles, defense technology. Allegation: transport vehicles for tanks. Status of the case: "Main Finance Administration in Nuernberg is investigating."

Ferrostaal AG, Essen—international trade with iron and steel, industrial plants, equipment, forges, infrastructure projects (sales: DM4.3 billion; 745 employees); sole shareholder is MAN AG, Munich. Allegation: general contractor for the construction of a gun factory. Universal forge. Status of the case: "Customs Investigation Office in Duesseldorf and Bochum prosecutors are investigating (Project Taji)."

Graeser GmbH, Fischbachtal/Hesse—partner is Ramzi Al Khatib. Allegation: business arrangement for a plant, to construct a gun factory. Status of the case: "Arrangement of business deals, investigations still ongoing."

Havert Handelsgesellschaft GmbH, Neu-Isenburg—Consult Project Engineering. Allegation: technical improvement of Scud missiles. Status of the case: "Main Finance Administration in Frankfurt is investigating. The enterprise was searched on 15 January 1991, records confiscated."

Heberger Bau GmbH, Schifferstadt—construction business (sales 1988: DM104 million; 471 employees), branch office: Heberger Bau GmbH, Baghdad, Iraq. Allegation: building for chemical weapons factories. Status of the case: "Customs Criminal Institute is investigating in connection with Taji. (Probably only construction activity exempt from licensing)."

H + H Metallform GmbH, Drensteinfurt/Muensterland. Allegation: computer-based installation for scrutiny of material and hardening process of gun barrels and grenade cases, rocket bodies, machines for the production of gas, and ultra-centrifuges required for uranium enrichment and rocket casings. Status of the case: "The Customs Criminal Institute and Main Finance Administration in Muenster are investigating. The Federal Office for Industry oversees reliability."

Hochtief AG, Essen—second-largest German construction enterprise (sales: DM5.5 billion; 26,400 employees). Allegation: construction of the foundation of a gun factory. Status of the case: "Included in the investigations of the customs investigating office in Duesseldorf and the Bochum prosecution regarding Taji."

I.B.I., Frankfurt/Main. Allegation: construction service for chemical weapons factory. Status of the case: "Cannot be pursued further, since the owner (Barbouth) went abroad and has meanwhile been murdered."

Integral/Sauerinformatic/ICME, Neumuenster. Allegation: computer programs. Status of the case: "Included in the investigations by the prosecution at the Land court in Bielefeld regarding Gildemeister."

Interatom GmbH, Bergisch Gladbach—planning, building and putting into operation of, among other things, breeder reactors, high-temperature reactors and

research reactors; uranium enrichment plants; superconductor magnets (sales: DM422 million; 1,570 employees), subsidiary of Siemens AG, Munich. Allegation: nuclear technology. Status of the case: "Investigations underway. Under pressure by the federal government, Interatom has terminated training program for Iraqis and will not deliver shop for building pipelines."

Inwako GmbH, Bonn—import and export. Allegation: technical improvement of Scud B missile, magnets for plant for uranium enrichment. Status of the case: "Prosecutor's office in Bonn is investigating."

Kavo. Allegation: electrical components for nuclear weapons factory. Status of the case: "Customs Criminal Institute charged with investigation."

Kloekner Industrie-Anlagen GmbH, Duisburg—-independent engineering consulting (sales 1988: DM613 million; 630 employees), subsidiaries, among other places, in Teheran, Iran, and Riyadh, Saudi Arabia; partner is the Handelshaus Kloekner & Co. AG, Duisburg. Allegation: compressors and machine parts, steel production for gun factory. Status of the case: "Ancillary delivery to Ferrostaal (Taji); Customs Investigation Office in Duesseldorf and Bochum prosecutors are investigating."

Loybold AG, Hanau (no longer included in latest list)—vacuum technology, coating installations (sales: DM1 billion; 5,400 employees), sole shareholder is Degussa AG, Frankfurt; compare there. Allegation: three casting installations for gun factory. Status of the case: "according to DER SPIEGEL of 6 August 1990, delivery of three resmelted installations for Taji (also, see Ferrostaal); according to DER SPIEGEL of 13 August 1990, delivery of auto-fretage installation of the firm of Schmidt, Kranz & Co. with export license."

LOI Essen Industrieofenanlagen GmbH, Essen—furnaces, rapid heating and cooling installations, inert gas installations (sales: DM160 million; 520 employees), parent company: Ruhrgas AG, Essen. Allegation: smelting furnaces for gun production. Status of the case: "Included in the investigations of the Customs Investigation Office in Duesseldorf and Bochum prosecution regarding Taji."

Mannesmann Demag AG, Duisburg—machine and plant construction (sales: DM4.1 billion; 19,800 employees), subsidiary of Mannesmann AG, Duesseldorf, compare Mannesmann Demag Huettentechnik. Allegation: production plant for weapons and ammunition. Status of the case: "Ancillary delivery to Ferrostaal (Taji project). Customs Investigation Office in Duesseldorf and Bochum prosecutors are investigating."

Mannesmann Demag-Huettentechnik, Duisburg—blast-furnace installations; branch operation of Mannesmann Demag AG, Duisburg, a 100-percent subsidiary of Mannesmann AG (sales: DM22.3 billion; 121,000 employees), Duesseldorf. Allegation: casting equipment for gun factory. Status of the case: "Included in the

investigations of Customs Investigation Office in Duesseldorf and Bochum prosecution regarding Taji."

Maschinenfabrik Ravensburg AG, Ravensburg—machine tools (sales 1988: DM36 million; 195 employees). Allegation: machine tools. Status of the case: "Ancillary delivery to Ferrostaal (Taji); Customs Investigation Office in Duesseldorf is investigating."

MBB-Transtecnica, Taufkirchen—enterprise of the Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn; also see Daimler-Benz AG. Allegation: calibration instruments for rocket research. Status of the case: "Investigations by prosecutors at the Land Court Munich II still continue in connection with the criminal proceedings against the Consen subsidiary, PBG."

Philips GmbH, systems and special technology division, Bremen—equipment, installations, and systems in the fields of optronics, position finding, communications, and data processing for defense technology and civilian use. Belongs to Philips corporation, Eindhoven, Netherlands. Allegation: night sight equipment. Status of the case: "Main Finance Administration in Bremen is investigating."

Rhein-Bayern Fahrzeugbau GmbH & Co. KG, Kaufbeuren—business manager: Anton Eyerle (mentioned separately by Helms), special vehicles of all types, beverages, laboratory, workshop, ambulance and radio vehicles (sales: DM25 million; 50 employees). Allegation: mobile toxicological laboratory. Status of the case: "Main Finance Administration in Munich has not found unauthorized exports. There were ancillary domestic deliveries to Iveco-Magirus Deutz. Main Finance Administration in Munich continues investigations."

Saarstahl AG, Voelklingen—iron and steel (sales: DM2.5 billion; 9,300 employees). Allegation: metal for production of gas centrifuge components for uranium enrichment. Status of the case: "See Export-Union."

SMS Hasenclever GmbH, Duesseldorf—machines and complete installations for the forging and metal extruder industry (sales: DM164 million; 455 employees), subsidiary of SMS Schloemann-Siemag AG, Duesseldorf, which is owned with parity votes by MAN AG, Munich, and Siemag Weiss Stiftung & Co. KG. Allegation: forging press for gun factory. Status of the case: "Included in investigations by the Customs Investigation Office in Duesseldorf and Bochum prosecution regarding Taji."

TBT Tiefbohrtechnik GmbH, Dettingen (no longer included in the new Helms list)—machine tools and tools (sales: DM81 million; 510 employees), shareholders are SIG Schweizerische Industrie-Gesellschaft, Neuhausen, Switzerland, and Gildemeister AG, Bielefeld (see there). Allegation: drilling equipment for gun factory. Status of the case: "Included in investigations by Bochum prosecution of the Taji complex, as well as investigations by Bonn prosecution in the Inwako proceedings."

Thyssen Rheinstahl Technik GmbH, Duesseldorf—planning, delivery and construction of industrial plants of all types ready for use (sales: DM440 million; 547 employees). Allegation: plant for the production of arms and ammunition in Taji. Status of the case: "Investigations underway at the Bochum prosecutor's office."

3. Deliveries via Foreign Countries

Asea Brown Boveri AG, Mannheim—90 percent of shares owned by ABB Asea Brown Boveri AG, Zurich, Switzerland. Allegation: Electrical equipment for smelting furnaces in gun factory. Status of the case: "Smelting furnaces which possibly require license were delivered by the Swiss ABB."

Dornier GmbH, Friedrichshafen—space and defense technology, business management in the hands of Daimler-Benz subsidiary, Aerospace AG. Allegation: codevelopment of the "Alphajet" ground-attack aircraft. Status of the case: "Cooperation partner in 'Alphajet'. Was exported from France."

MBB Messerschmitt-Boelkow-Blohm GmbH, Ottobrunn—aeronautics and space enterprise (sales: DM 6.3 billion) of the Daimler-Benz subsidiary Deutsche Aerospace AG. Allegation: partner in Euromissile (50 percent). Status of the case: "Euromissile. Hot/Roland—German-French cooperation. Exports came from France."

4. Criminal Proceedings Initiated

Gildenmeister Projecta GmbH, Bielefeld—industrial plants, linked enterprise (100 percent) of the Gildenmeister AG (lathes, guidance systems, sounding borers; corporate sales: DM552 million; 1,910 employees). Bielefeld, see TBT Tiefbohrtechnik. Allegation: general contractor for chemical weapons factory SAAD 16 and missile programs; computer programs. Status of the case: "Criminal proceedings initiated by Bielefeld prosecutors."

GPA (Wiesenthal Center list). Status of the case: "Consen subsidiary, subject matter of the criminal proceedings against Consen subsidiary PBG at Land Court Munich II."

PBG Project Betreuungs GmbH-Bohlen Industrie GmbH, Essen: Managing holding company for affiliated companies for the production of chemicals, explosives, powder. Parent company of the Consen group. Allegation: rocket technology. Status of the case: "Office of the Prosecutor Munich II has initiated criminal proceedings against responsible parties."

Rotexchemie International Handels-GmbH & Co., Hamburg—pharmaceutical specialties and chemical raw materials (sales: DM100 million; 40 employees). Allegation: sodium cyanide needed for hydrogen cyanide and tabun. Status of the case: "Criminal proceedings underway by Hamburg prosecutors. The merchandise

was returned to Belgium. Belgium meanwhile has introduced obligation to obtain a permit for all chemicals on the lists of the Australian Group. Incidentally, merchandise was clearly destined for Iran only."

5. The Karl Kolb Connection

Karl Kolb GmbH & Co. KG, Dreieich-Buchschlag—Scientific Technical Supplies. Export of scientific equipment, new installation of laboratories abroad, technical offices/sales branches, among other places in Baghdad, Iraq, Kuwait, and Riyadh, Saudi Arabia (sales 1988: DM33 million; 62 employees). The six limited partners want to dissolve the Kolb firm by year's end. The reason is purported to be a large drop in orders which has already led to a staff reduction to 22 employees. Allegation: chemical weapons factory, laboratory equipment for material tests, equipment for biological agents. Status of the case: "Criminal proceedings against responsible parties underway at Darmstadt Land Court."

Ludwig Hammer. Allegation: equipment for armament factory. Status of the case: "See criminal proceedings against responsible parties of the Karl Kolb enterprise et al. at Darmstadt Land Court."

Pilot Plant (in liquidation). Dreieich. Allegation: chemical weapons factory. Status of the case: "Subsidiary of Karl Kolb. Criminal proceedings against responsible parties underway at Darmstadt Land Court."

Preussag AG, Hannover—conglomerate merged with Salzgitter AG. Allegation: building for chemical weapons factory. Status of the case: "Investigations by public prosecutor/criminal proceedings underway at the office of the prosecutor in Darmstadt in connection with the Karl Kolb complex."

Quast. Allegation: corrosion-proof alloys. Status of the case: "Was subcontractor of Pilot Plant (domestic business deals)."

Rhema-Labortechnik. Allegation: inhalation chambers for chemical weapons research establishment. Status of the case: "See Karl Kolb (ancillary delivery)."

Uni-Path GmbH (formerly Oixid GmbH), Wesel—wholesaler. Allegation: bacteriological nutrient mediums. Status of the case: "Ancillary supplies to W.E.T."

W.E.T. Water Engineering Trading GmbH, Hamburg. Allegation: chemical substances for the manufacture of nerve gas. Status of the case: "Darmstadt prosecutors have initiated criminal proceedings (Karl Kolb complex)."

Carl Zeiss, Heidenheim (Brenz)—microscopy, medical-optical equipment, measurement technology, optometrics (sales: DM1.3 billion; 8,300 employees), individual enterprise owned by the Carl-Zeiss-Stiftung. Allegation: equipment for chemical weapons factory. Status of the case: "Was ancillary supplier of Karl Kolb."

6. Status of the Case: "?"

Eltro GmbH, Heidelberg—company for radiation technology, optronic equipment, heat image screens, missile guidance, mine sweeping system (sales 1988: DM71.5 million; 477 employees); partners are Telefunken System Technik GmbH, Ulm, and Hughes Aircraft Company, Culver City, California. Allegation: rocket guidance systems. Status of the case: "Rocket guidance systems."

Georg Fischer AG, Schaffhausen—mechanical engineering (sales: DM2.8 billion). Allegation: equipment for gun factory. Status of the case: "It is a Swiss enterprise in Schaffhausen; ancillary deliveries to Taji."

Industrie-Werke Karlsruhe Augsburg AG, Karlsruhe—regulating technology, welding engineering, defense technology, packaging, trade and services (sales: DM1.4 billion; 6,800 employees). Allegation: machine tools. Status of the case: "?"

Mannesmann-Rexroth—one of the more than 250 subsidiaries and associated companies of the Mannesmann corporation at home and abroad. Allegation: gun components. Status of the case: "This concerns the Belgian Mannesmann subsidiary, G.L. Rexroth NV SA. Transit of parts which the firm intended to deliver for the 'big gun' were held up in Frankfurt."

Mausierwerke Oberndorf GmbH, Oberndorf—machine tools, measurement technology, weapons systems (1,450 employees), an enterprise of the Diehl group, Nuernberg. Allegation: equipment for rocket research. Status of the case: "?"

Nickel GmbH. Allegation: airconditioning technology for rocket factory. Status of the case: "?"

Promex Explorations GmbH. Allegation: rocket technology. Status of the case: "?"

Schaerer Werkzeugmaschinen. Allegation: lathes for the production of artillery shells. Status of the case: "?"

Stalco Industrieanlagen. Allegation: arranging arms deals. Status of the case: "Firm of the Iraqi secret service, arrangement of arms deals?"

Teldix GmbH. Allegation: rocket technology. Status of the case: "?"

Waldrich Siegen Werkzeugmaschinen GmbH, Burbach. Company controlled through subsidiary of Ingersoll International Incorporated, Rockford, Illinois, United States. Allegation: machine tools for rocket factory. Status of the case: "?"

Weiss Technik. Allegation: heat and cold chambers. Status of the case: "?"

Fritz Werner Industrie-Ausruestungen GmbH, Geisenheim: industrial equipment, machine tools for special purposes, testing machines (sales 1988: DM205 million).

Allegation: universal drilling equipment for chemical weapons factory. Status of the case: "The enterprise ended its involvement."

Companies Deny Illegal Arms Deals With Iraq

91GE0156A Bonn DIE WELT in German 15 Feb 91
p 12

[Article by "mik": "We Are No Helpers of Saddam Husayn": On the Confidential Preliminary Report on the Investigation for Suspicion of Illegal Arms Exports"]

[Text] The interim report to the Federal Government on the investigations by German authorities of those suspected of illegal arms exports to Iraq, published verbatim by DIE WELT ("Saddam Husayn's German Business Partners," DIE WELT 11 February) met with a lively response. Several radio and television stations aired contributions. Daily newspapers published excerpts. Managers of companies mentioned on the list of U.S. Senator Helms sent comments to DIE WELT. In the following, the replies by the companies are printed in their exact wording.

Dynamit Nobel AG, Troisdorf:

"The list also mentions our company, accusing Dynamit Nobel of having delivered a production plant for arms and ammunition. The Office of the Public Prosecutor in Bonn is said to be investigating. Concerning that, it may be stated that Dynamit Nobel did not deliver any production plant for arms and ammunition to Iraq, and also did not in any other way participate in building such a plant. It also is not correct that the office of the Public Prosecutor in Bonn is conducting investigations of it."

Eltro GmbH Gesellschaft fuer Strahlungstechnik, Heidelberg:

"You write that Eltro GmbH in Heidelberg is suspected of having had business dealings with Saddam Husayn. That accusation is false. Investigations by the public prosecutor into that were halted on 6 February."

On 6 February the Office of the Public Prosecutor in Heidelberg informed Eltro: "Regarding preliminary proceedings for violation of the Military Weapons Control Law and the Foreign Trade Law. Dear Ladies and Gentlemen, the investigation pending in the Office of the Public Prosecutor in Heidelberg was dropped as of today in accordance with Article 70, Section 2, of the Code of Criminal Procedure."

Gildemeister Projecta GmbH, Bielefeld:

"1. Gildemeister Projecta delivered and installed laboratory and workshop facilities for universal applications for the SAAD 16 project. That project does not involve an industrial plant, but rather laboratories and workshops, comparable to facilities at universities, technical educational establishments, and testing institutes, that is to say, facilities which are not specifically built for

military purposes. The equipment delivered is not suitable for the development or production of NBC [Nuclear Biological Chemical] weapons. Development know-how was not included in the framework of the order. Half of the order value was for buildings and infrastructure. The project had a total value of approximately 400 million German marks [DM] and not, as alleged in the press, DM1.6 billion.

"2. In April 1989 the Office of the Public Prosecutor initiated an investigation of employees of Gildemeister Projecta GmbH on suspicion of having violated the Foreign Trade Law. In August 1990 the following position taken by the Bielefeld Public Prosecutor's Office was published in the WESTFALEN BLATT: 'Essentially, according to Senior Public Prosecutor Jost Schmiedeskamp, the investigation is concentrating on a single employee (not mentioned by name) of the Bielefeld company. He is suspected of having negligently delivered computer equipment—not guns and equipment for the production of poison gas—to Iraq.'

"3. Regarding the present state of the investigation, we enclose an article from the NEUE WESTFAELISCHE referring to the SPIEGEL article of 4 February 1991: 'Concerning a charge against managers of Gildemeister Projecta GmbH in Bielefeld for having built a military research center in Iraq, according to SPIEGEL, a controversy has developed between the Federal Government and the Public Prosecutor's Office, which is handling the preliminary proceedings. After two years of investigation into the company's role in the DM1.5-billion plant at Mosul, the criminal prosecutors wanted to bring charges in only two instances, in which the company did not have the required permits. Bonn's objection that Gildemeister obtained permits in five additional instances based on misrepresentation was rejected by the prosecuting attorneys, according to SPIEGEL. The control authorities are said to have been informed of the attempts to deceive them but nevertheless gave their consent.'"

Heinrich Mueller Maschinenfabrik GmbH, Pforzheim:

"The Heinrich Mueller Maschinenfabrik GmbH, with its headquarters in Pforzheim, is the victim of confusion with another company with a similar name. The injection nozzles allegedly delivered by it—as press inquiries have found—were in fact (and without the need for a permit) delivered by the Heinrich Mueller GmbH company, 8508 Wendelstein, a company which has nothing to do with the Pforzheim firm and its owners.

"The Heinrich Mueller Maschinenfabrik located in Pforzheim delivered neither know-how, nor injection nozzles, nor any other parts to Iraq, which in any way contributed to the technical improvement of the Scud B missile or to Iraq's arms industry."

The PFORZHEIMER ZEITUNG reports: "This is not the first time that the Heinrich Mueller Maschinenfabrik in Pforzheim is mentioned. And now it fears for its reputation, because it is confused with the Heinrich

Mueller GmbH in Wendelstein." And it continues: "The PFORZHEIMER ZEITUNG has made inquiries of the police ('no knowledge') and the Chamber of Industry and Trade. The managing director of the Chamber of Industry and Trade, Alfred Breuer, indicated that there was nothing against the company."

Teldix GmbH, Heidelberg/Robert Bosch GmbH, Stuttgart:

"The preliminary investigation of Teldix GmbH, Heidelberg, which belongs to the Bosch Group, in connection with alleged arms deliveries to Iraq has—as the Public Prosecutor's Office in Heidelberg announced last week—been closed. A corresponding charge from a private party turned out to be unfounded. It has not been possible to prove Teldix guilty either of violations of the Military Weapons Control Law or the Foreign Trade Law. From the outset Teldix rejected the accusation as inaccurate."

Thyssen Rheinstahl Technik GmbH, Duesseldorf:

"The accusation found in your list, that Thyssen Rheinstahl Technik should have built a plant for the production of arms and ammunition in Taji, is false—and equally false is the 'information' that the Public Prosecutor's Office in Bochum is currently investigating Thyssen Rheinstahl Technik. A call from your editors to the Public Prosecutor's Office could have resulted in clarification of that and could have spared us false suspicions."

Carl Zeiss, Oberkochen:

"Accusations in connection with arms exports to Iraq and the production of chemical weapons have on occasion been publicly directed against the Carl Zeiss company recently. Carl Zeiss has been unjustly attacked and emphatically rejects the accusations."

"The Oberkochen company gets about 50 percent of its turnover from exports. Before the UN embargo was imposed, the company delivered medical-optical equipment, microscopes, measuring instruments, and equipment for industrial quality assurance to Iraq—just as to many other countries in the world. In the 1980's Carl Zeiss built two telescopes for an astronomical observatory in Iraq. Since the embargo was imposed on 7 August 1990, the company has not delivered anything more to Iraq. All previous deliveries were—as is the normal way of handling contracts at Zeiss—examined for potential permit requirements. Carl Zeiss has never delivered defense technology or arms-relevant products to Iraq and also did not contribute to the production of chemical weapons."

"Carl Zeiss strongly objects to being represented as an arms supplier to Iraq. The company has not violated the export laws. Since the embargo there have been no more deliveries to Iraq."

Assistance for Iraqi Nuclear Program Detailed

91WP0070A Berlin DIE TAGESZEITUNG in German
16 Feb 91 p 5

[Article by Thomas Scheuer: "Delivery of Hot Furnaces to Baghdad Completely Legally: U.S. Investigators Stopped Delivery to Baghdad in Summer of 1990; High-Temperature Furnaces Sent by European Firms Are Also Used in Nuclear Industry; German Company Also Involved; Installations Not Considered Weaponry"]

[Text] Freiburg—During the summer of 1990, U.S. customs investigators at the port of Philadelphia halted a shipment destined for Iraq. The containers held high-temperature furnaces like the kind used in the arms and nuclear industry to treat special metals and alloys. The export was stopped because of "its potential use in the production of atomic weapons," according to an official involved in the incident. According to information from intelligence services, the Iraqis had ordered a total of seven such furnaces, of which three were in the United States and two in England. The governments in Washington and London banned the export of the installations, some of which were already prepared for shipment. In a so-called non-paper to friendly European governments, it was noted that the seven furnaces ordered by Iraq combined would yield "a greater capacity than that of the Los Alamos foundry, for example." The comparison was an obvious one: Los Alamos is the site of the central U.S. atomic weapons program.

According to information uncovered by DIE TAGESZEITUNG, Baghdad's procurement agents were also doing business with a trio of companies headquartered in Liechtenstein, Switzerland, and the FRG. Early last summer, Germany's Arthur Pfeiffer-Vakuumtechnik GmbH in Asslar, near Wetzlar, delivered two high-vacuum furnaces and other equipment to Baghdad. Several components were also provided by Balzers Hochvakuum AG in Zurich. All of the contracts with the Ministry of Industry in Baghdad went through Balzers Liechtenstein. The three companies are linked by their owner: All of them belong to the Swiss Buehrle-Oerlikon group—a well-known name in the international arms trade.

The largest part of the installations was produced by Arthur Pfeiffer-Vakuumtechnik in Wetzlar: two high-vacuum heat-treatment furnaces (models MOV 551 and MOV 542) as well as a vacuum smelting and casting installation (VSG 300), for a total of nearly 1.5 million German marks [DM]. The delivery was made at the end of May 1990. In July, another vacuum smelting and casting installation (VSG 030 B) followed, for DM1,264,171, as well as a vacuum heat-treatment furnace (COV 652 HV) for DM1,213,369. However, the third part of the deal fell through. Company records indicated 15 November 1990 as the delivery date for two vacuum smelting and casting installations (VSG 300 and

VSG 040 P, DM2,506,470 and DM2,059,895). However, the UN embargo against Iraq was already in force by then. It was also impossible to carry out two extensive shipments of replacement parts, valued at more than DM600,000. Furthermore, part of the training of Iraqi personnel agreed to in the contract was no longer possible. Still, "training was provided for DM146,300" by the producer prior to the embargo—in Wetzlar. The equipment delivered by Balzers to Iraq directly from Zurich and Liechtenstein appears to be modest in scope: leak indicators, vacuum pumps, tungsten wire, and other minor material. A vacuum testing chamber for around a million Swiss francs was held back because of the embargo; another shipment was stopped at the Frankfurt airport and sent back.

The described technology transfer demonstrates a shortcoming in the current debate on export controls, which is being completely reduced to the illegal movement of arms and armament technology: The export of the special installations in question to Iraq was completely legal, since they were not actual weaponry. The Federal Office for Economics in Eschborn issued so-called negative certificates, which have in the meantime been frantically revoked. In an interview with *DIE TAGESZEITUNG*, an executive with Arthur Pfeiffer GmbH calls the delivered equipment "classic dual-use installations," and makes no bones about the fact that they "are just as suitable for the production of artificial hip joints as they are for heat-treating the cores of projectiles." Thus, legally speaking, the transaction was completely proper. But morally? "Today," says the executive, one might in fact say, "No, let's stay clear of that" with respect to that type of client nation.

Back in the spring, moreover, the CIA had reported on attempts by Pakistan to obtain these special furnaces by devious means. The fear of one foreign investigator that Arthur-Pfeiffer-Vakuumtechnik GmbH could have seen Pakistan as a substitute buyer of the Iraqi goods halted by the UN embargo is allayed by a member of the company's management team, speaking to *DIE TAGESZEITUNG*: "That stuff is still on hand here."

NETHERLANDS

Safety of Nuclear Power Plants Assessed

91WP0064A Amsterdam *DE VOLKSKRANT* in Dutch
5 Jan 91 p 17

[Article by Martijn van Calmthout: "Risks of Nuclear Energy Not Reflected in Numbers Alone"—first paragraph is *DE VOLKSKRANT* introduction]

[Text] Risk analyses of nuclear power plants are not as reliable as the numbers suggest. Estimates of the chance of an accident can vary by a factor of 10,000; moreover, the human factor is usually seriously underestimated in the analyses.

How safe are Netherlands nuclear power plants? At the end of last year, the Energy Policy Study Group, an independent think tank headed by Prof. Dr. W. Turkenburg, called attention to certain types of reactor malfunctions that have been a focus of discussion in the United States for some time.

In any event, Borssele should be shut down, energy experts argued, in order to figure out whether such incidents could in fact occur and whether they would be dangerous. The question relates to an imaginary situation where the hot core of a power plant dries out and untreated emergency cooling water is poured over it. This could damage the core and would potentially boost the reaction instead of bringing it under control.

After he was accused by the nuclear energy sector of amateurish rabble-rousing, Turkenburg restated his arguments in greater detail in *DE VOLKSKRANT*. What many people lost sight of amidst the fleeting, primarily political tempest was the fact that the group was only calling for a study of safety in light of recent new information. There was clearly no allegation that Borssele might be less safe than is thought. To say so would have been somewhat premature anyway, given the complex studies that are necessary in order to judge how (un)safe a nuclear power plant really is.

And in early December that was grist for the mill of Minister of Social Affairs de Vries, who is jointly responsible for safety at Netherlands nuclear power plants. Responding to questions in the Chamber, he was able to declare that the new factors being advanced have already been included in the risk analyses currently being conducted in Dodewaard and Borssele by a consortium of American and German companies.

Both plants are being subjected to a fine-tooth comb in order to support the contention right after Chernobyl (1986) that "something like that can never happen here." "Relax," seemed to be minister's motto.

Dr. W. Biesiot, a risk specialist with the Interdepartmental Research Group for Energy and Environmental Studies (IVEM) at the University of Groningen, was scarcely surprised by the latest nuclear energy affair. "About every five years you see a lot of fuss about a particular accident mechanism," he says. "First it was Three Mile Island, then Chernobyl. And now this. I predict that it won't be the last time."

In the wake of Chernobyl, Biesiot was appointed to the reconstituted Reactor Safety Commission (CRV), a government advisory board examining all possible safety aspects of nuclear energy. Based on American studies, the CRV back in 1989 recommended taking a good look at reactivity accidents, the type of incident under discussion in December. Regardless of how unlikely they may seem.

Biesiot: "Historically speaking, there have always been certain components and accident scenarios that have been left out of the discussion. Until the pressure

becomes so great that policymakers and those who make the rules pick up on it. The incidents seemed too unlikely to examine seriously. My main point is that you can't rule out anything, because we assess risks rather indiscriminately. There are arbitrary decisions by policymakers not to include certain things."

Still one of the best examples of that problem is the first modern risk analysis of a nuclear power plant, the famous WASH-1400 study by Rasmussen in 1975. That study examined the risk of damage to the reactor core, based on a number of failure scenarios.

Up to then, risk analyses had always been based on the idea that a main pipe in the reactor's cooling water system gives way all at once or that a control rod falls from the plant. A supplier of a plant had to show beyond any doubt that his product could not run amok even in that case.

"The Rasmussen study showed surprisingly well that small ruptures are much more relevant in connection with core damage. In particular, you don't see them as quickly," says Biesiot. "Not that no attention had been given to small pipe ruptures before that time. But it had been assumed that they were overshadowed by the major pipe rupture. And that simply turned out to be untrue."

In principle, the formula for this type of probabilistic risk analysis is simple, based on a whole range of occurrences in which the failure of an initial component or system may or may not be compensated for by systems further down the line. If it is not—and there is always a certain chance that this will happen—then it is up to another component or system to compensate for the malfunction, and this in turn can succeed or fail. And so on. For a full nuclear power plant, figuring out everything that can go wrong or right quickly adds up to more than 10 man-years of work.

In this way, entire chains of failure incidents are conceivable that ultimately result in damage to the reactor core. Even then, it remains unclear whether this will lead to contamination of the reactor building or its surroundings.

In theory, the chance that things will go wrong in a big way is formulated from all the chances that a safety installation will not work or will malfunction at each of the critical points. "If we assume that the events in the failure chain are independent, then the chance that that chain will become a reality is the multiple of all those small chances," says Eng. A. Versteegh, the head of nuclear energy at the Netherlands Energy Research Center (ECN) in Petten, summarizing the process of the mathematical risk analysis.

Calculated in this way, the chance of core damage is once in every hundred thousand reactor years for a modern plant, says Versteegh. Insofar as an absolute value can be assigned to this, he clearly considers that unacceptable. "I was in Chernobyl after the bang. Deserted towns, bare terrain, you would have to be inhuman not to be affected

by it. If it were not humanly possible to preclude such a major accident at our Western plants, then I would be absolutely opposed to nuclear energy."

Versteegh points out emphatically that the results of risk analyses begin too easily to lead their own lives. A risk analysis, he believes, is primarily an instrument for examining where the weak spots are in the design for a plant and its safety mechanisms. "Using it, you can see which failure is dominant. Let's say that the breakdown of the power supply system is the beginning of 80 percent of the accident scenarios. At that moment, all pumps and control systems shut down, and the emergency power supply must take over. It could also fail. Then you can put in an extra diesel engine or some other piece of equipment, and suddenly the risk is lowered by a factor of 10 or more. This has little to do with the absolute value of your numbers; it shows where you should spend your money, what areas merit attention and inventive-ness."

There are those who sharply criticize the strictly mathematical approach to the risks of a nuclear power plant. The whole numerical forecasting business is lost on Leiden professor of functional theory, Prof. Dr. W. Wagenaar. "Utter nonsense, and anyone can figure that out," he says assertively. "At a chance of one in a million that something serious will go wrong, it is not very likely that we would have the handful of accidents that we have seen happen in the couple of thousand reactor years that have now. The chance of a reactor accident is simply much greater, probably something around once in a thousand reactor years. Anyone who says anything different is relying on theoretical calculations instead of what he is seeing in practice. The analyst is crazy, not the facts."

Statisticians may bristle at this. But there is an obvious potential for serious criticism of the methodologies used in risk analyses. "It is impossible to prove that you are considering every single scenario," says risk analyst Biesiot.

ECN staffer Versteegh agrees that there could be substantial uncertainty lurking behind the results of such exercises. "You definitely won't go beyond one order of magnitude. But especially once we look at increasingly unlikely scenarios, the margins of uncertainty begin to narrow quickly." He feels that this is another reason why the results of analyses should not be considered so absolute. "What is the sense of knowing whether there will be victims once in a hundred million years or once in ten billion years? You have to avoid victims; that is what it's all about."

There are various reasons for the substantial margins of error in risk assessments. The basis for a probabilistic risk analysis is provided on the one hand by the scenarios, but on the other hand by the chances of failure that must be assigned to all critical points in the chains of miscarrying safety systems.

For the latter, the approximately 4,000 operating years logged by all the nuclear power plants in the world since the 1950s are of inestimable importance. Thanks to a reporting system for failing components at nuclear power plants linked to a joint data base, detailed statistics are available on the hundreds of thousands of components assimilated into a nuclear power plant.

However, Biesiot points out, this does not mean that all these statistical data are of equal value. "It all depends on how you arrange your data. You can use the entire set of failing shutoff valves of a certain type, but you can also ask yourself under what circumstances they failed. If you apply additional criteria, then the set of usable data gets smaller and smaller. In that case, the margin in the chance of failure increases rapidly."

ECN staffer Versteegh believes that these statistical inaccuracies are not the most important sources of uncertainty concerning the chance of a nuclear power plant accident. After all, he says, if the risk analyst has doubts about whether a certain component is being exposed to normal circumstances, then it is often assumed for safety's sake that it is not functioning, and the consequences of this are examined. Sometimes laboratory tests are conducted to see what will happen under these specific conditions. "This could mean that you lower the calculated risk by a factor of 10 without having done anything to the power plant itself."

But sometimes the tests can yield quite uncomfortable results. Last summer, the results of a European study were released in which researchers examined in practice what happens when a nuclear reactor loses its cooling water, known in the jargon as a LOCA (loss of cooling accident). Essentially, the study simulated the 1979 accident at the nuclear power plant in Harrisburg under experimental conditions at a test reactor in Idaho.

Until then, experts thought that they had a conclusive analysis of the Three Mile Island accident. To their surprise, however, they saw that four times as much hydrogen was generated when the nuclear fuel pack—as planned—began to melt from its own overheating. Thus, the core released three times more radioactive products than was predicted.

Versteegh sees in results like this one of the, in his eyes, important reasons for inaccuracies in the risk analysis of nuclear power plants. "First of all, there are conceivably very complicated and quite unlikely lapses in the reactor where you do not know with 100 percent certainty what is going to happen. Secondly, with the risk analysis you always have the problem of having to be certain that the failure chances of components are independent of each other. If that is not the case, then one defect can directly have a whole range of consequences. For example, if a fire wipes out all the electrical lines, then the plant is paralyzed. For that reason, for example, you don't lay all the lines in the same channel." As his last point, Versteegh mentions the operation of a plant. "And that is especially hard to predict."

In that the ECN staffer has hit the nail on the head, says Leiden psychologist Wagenaar. "Human behavior is scarcely considered in a realistic manner in the risk analyses. Someone is repairing a lamp, drops the screwdriver, which causes a short circuit somewhere, and the reactor is uncontrollable because the control panel no longer works. That has not been included in a single scenario, but it has really happened."

According to Wagenaar, there is a need for an entirely different type of risk analysis, reflecting the dominant role of human beings. "You have to examine what people can do wrong and under what circumstances that happens. And then do something to avoid those circumstances. Admittedly, that has already been done to a limited extent, but generally this involves marginal things, such as people pressing the wrong button. From Chernobyl we know that it is not a question of the wrong buttons. It is a question of idiotic planning and behavior by people who subsequently press the right buttons. The technicians will always dismiss that as abnormality, but that is no argument. It is precisely a question of abnormalities now."

Even in strictly mathematical risk analyses, the human factor is indeed already an important unknown, says Groningen researcher Biesiot. A considerable part of the failure chances and chances of certain situations are not at all based on statistics from a data base, but rather on the assessment of a limited group of experts.

Ignoring the question of what the criteria for choosing such experts could be, it is clear from scientific research that jointly reached expert opinions definitely do not lead directly to reasonable estimates of, say, the chance that a nuclear fuel pack will melt down at a power plant.

Delft statistician Dr. Roger Cooke has written about the use of expert opinions in a book to be published this spring. The manuscript is making the rounds in Delft like a set of lecture notes. Cooke, who consults for, among others, the Ministry of Environmental Affairs (VROM) and the European Space Agency (ESA), sometimes sees in reactor safety studies risk estimates that vary by a factor of 10,000. At the same time, he notes that coordinating authorities sometimes tend not to address this enormous distribution clearly. Cooke: "And there is little reason to assume that by insisting on unanimity they are being pushed in the direction of the truth."

As a consequence, estimates of risk actually do not wash very well, especially with respect to complex but truly disastrous accidents at nuclear power plants. "In those areas, the fog grows thicker and thicker, which at best is acceptable because you know that beyond a certain limit the chance of a very big accident falls off sharply," says Biesiot. "If the chance of a bigger and bigger accident were to decrease any less rapidly, we would have an enormous problem."

All in all, the uncertainty is not really that disturbing at first glance; after all, we are talking about very small

chances of an accident. But since the memorandum, "Dealing With Risks," was published last year, the official government policy is that even very unlikely accidents must be covered by measures if the number of victims could be very large. An accident with a chance of, say, once in a billion years may cause no more than 100 deaths in order for it to be inappreciable according to Dutch standards. If the consequences appear to be more serious, then measures must be taken.

"What you are doing in the area of small probabilities is rowing yourself further into the nebulous morass," says Biesiot, describing the paradox. "On the one hand, you want to be sure that you are dealing with extremely small chances, but on the other hand the onus of proof for it is increasingly shaky. The bottom line is that you have got a nuclear power plant with a pack of nuclear fuel that you under no circumstances want to have in the living environment."

Stricter Technology Export Controls Sought

91EN0275A Rotterdam NRC *HANDELSBLAD*
in Dutch 8 Feb 91 p 12

[Unattributed article: "The Chamber Wants Stricter Arms Export Regulations"]

[Text] The Hague, 8 Feb—The Second Chamber yesterday once again called for stricter European legislation to prevent the export of technologically high-quality weaponry. The Netherlands Government should strongly support such a move within the EC context. Current legislation on the European and national level is inadequate.

The Gulf war shows where this situation can lead. It is "sad" that the allied troops there must "fight against weapons that they themselves exported," said PVDA [Labor Party] member of parliament Valk. CDA [Christian Democratic Appeal] speaker Koffeman spoke in this regard of a "less than distinguished role by the Federal Republic [of Germany]." The CDA and PVDA wondered whether there should not be a nonproliferation treaty in order to counter the proliferation of missile technology.

All these points were brought up during a verbal consultation between Minister van den Broek and the Chamber Foreign Affairs Committee concerning the Fourth Review Conference on the Nonproliferation Treaty (NPV) Against the Spread of Nuclear Weapons, held in Geneva in August and September.

The Chamber seemed pessimistic about the results of this conference, which is held every five years. At the conference, the United States and Great Britain refused to explicitly link further agreements on preventing the proliferation of nuclear weapons to agreements on halting nuclear testing.

The attitude of the two major powers was criticized by all speakers. According to Koffeman (CDA), an extension of the NPV has been jeopardized. Valk (PVDA) said that the credibility of the West among Third World countries has decreased. Tommel (Democrats 66) criticized van den Broek, saying that the Netherlands is perhaps too understanding of the U.S. and British position.

"You can tell friends the truth, and the truth is that they are too sluggish," said Tommel. Van den Broek promised to urge both major powers "to consider this linkage seriously."

SWITZERLAND

CERN Opens Laboratories to Italian Industry

91MI0086A Milan *ITALIA OGGI* in Italian 7 Nov 90
p 43

[Article by Ersilia Vaudo: "CERN Puts Its Laboratories at the Disposal of the Metal and Mechanical Industry"]

[Text] The metal and mechanical industry is pointing its reflectors on CERN [European Nuclear Research Center] in Geneva, the world's most advanced laboratory for the study of particle physics. The first step in this direction was made the other day at the headquarters of the Assindustria [Industrial Association] of Treviso, at a meeting between CERN members and representatives from the metal and mechanical industry. "In light of changes on the horizon, science and industry can now proceed together," said Gianni Pascotto, president of Assindustria's metal and mechanical manufacturers group. "A speedup in development can be scheduled and during the current slowdown in production society must invest primarily in research." The Italian government's commitment to this course of action was underlined by Maurizio Sacconi, under secretary to the Treasury, who announced that Italy's contribution to international projects such as the CERN project will amount to 138.5 billion lire in 1991, almost 50 percent more than in 1989. However, what are the real advantages that industry can draw from this cooperation?

The answer lies in the great technological opportunities CERN can offer industry. In fact, in the center, which is directed by Nobel Prize winner Carlo Rubbia, materials can be subjected to experimental conditions that cannot be reproduced in industrial laboratories, thus providing an excellent test bench. Moreover, by identifying defective elements and suggesting new solutions, CERN's scientists and technicians are actively involved in industry's technological development.

One of CERN's most advanced projects at present is the LHC [Large Hadron Collider], the accelerator of the "future" that will further our knowledge of particles and will also become an extremely important test facility for the more innovative companies. For this reason, Giorgio Crianti, associate director of CERN, has invited both

large and small industries located in the Treviso area to get in touch with CERN. "There are 730 metal and mechanical industries in the province, with revenues of about five trillion lire," Pascotto emphasized. "Nearly all of these use advanced innovative systems, and for these industries, research and new manufacturing technologies will become the strategic tool of the 1990s."

TURKEY

Paper Cited on U.S. Nuclear Arms Aimed at Iraq

TA2102193691 Jerusalem Domestic Service in English
1800 GMT 21 Feb 91

[Text] A Turkish newspaper writes that the United States has stationed missiles with nuclear warheads, aimed at Iraq, at a NATO base in southern Turkey. There is no confirmation of the report which appeared in the leftist Turkish daily, CUMHURIYET.

Turks Bid To Manufacture Patriot Missiles

NC2602174491 Istanbul HURRIYET in Turkish
21 Feb 91 p 12

[Sezai Sengun report: "Turkey Sends a Delegation to the United States"]

[Text] Ankara—Turkey is holding intensive talks in the United States to be able to manufacture Patriot missiles, which have proven to be the most important weaponry system in the Gulf war. In fact, Turkey has been engaged in a relentless competition with Israel and several Arab countries, which also wish to manufacture Patriot missile systems. A Turkish delegation is currently in the United States holding contacts on the matter. The delegation, headed by Vahit Erdem, undersecretary for the defense industry, held talks with the Raytheon Company, the main producer of Patriot missiles. It has made proposals aimed at establishing the framework for joint production. In defending the view that several important Stinger missile components are being manufactured in Turkey and that Turkey already has a significant infrastructure for producing missiles, the Turkish delegation is trying to establish the grounds for an agreement on various alternatives, including the concept of a joint production project and the concept of an assembly production project.

The Turkish delegation has already informed U.S. Defense Department officials that Turkey wishes to jointly manufacture the Patriot missile systems instead of the Maverick missiles. Plans were made for producing Maverick missiles in Turkey earlier.

A high-ranking official of the ROKETSAN Company, which manufactures several important parts of the Stinger missiles, has said that the infrastructure which will allow the production of the Patriot missile systems has not yet been fully completed in Turkey. He also noted that joint production of Patriot missiles would require at least two or three years and that the cost of the project may be very high.

Meanwhile, the Turkish delegation, which also includes Metin Lokmanhekim, director general of the Turkish Aviation and Space Industry Corporation, is also holding talks with the U.S. Defense Department to increase the number of aircraft that will be produced in Turkey in accordance with the F-16 project from 160 to 320. In addition, the delegation is making an effort to resolve the final hitches obstructing the sale to Egypt of 40 F-16 aircraft which have been manufactured in Turkey.

UNITED KINGDOM

Scientist Says Iraq Might Possess Giant Guns

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[Report by Alastair Percival, PRESS ASSOCIATION]

[Text] Iraq may have been able to assemble two giant mobile guns that could reach Israel with chemical or conventional shells, a British scientist said today. Metallurgist Dr Christopher Cowley, who helped design the "supergun", said Baghdad had the blueprints and most of the parts needed for two 350mm cannons. They would be the world's largest artillery pieces, built from components unwittingly supplied by British firms before customs officers intercepted further shipments last year. The two cannons were intended as prototypes for the satellite-launching "supergun" that would have had a range of 900 miles.

Dr Cowley, 52, from Bristol, said Iraq lacked only the breech slide assemblies to complete the weapons last summer.

"Nobody knows what Iraq has been doing since then and potentially they may have found another supplier like China. If they did, they have a system that will work." He added: "It's not a threat of any consequence. As soon as they are fired, the guns would be targeted by the allies and disappear off the face of the Earth."

Dr Cowley was cleared last November of involvement in illegal exportation of military equipment. He acted as an intermediary between British firms and space research corporation, the Brussels-based company of murdered ballistics expert Dr Gerard Bull.

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